Internal Control Failures and Corporate Governance Structures – A Post Sarbanes-Oxley Act (SOX) Analysis

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Internal Control Failures and Corporate Governance Structures – A Post Sarbanes-Oxley Act (SOX) Analysis

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SUMMARY

Recent corporate scandals suggest a breakdown in internal controls and the lack of adequate corporate governance mechanisms. In 2002, Congress passed the Sarbanes-Oxley Act, which requires firms to assess internal controls and report internal control weaknesses. My study examines the causes and consequences of material weaknesses (MW) reported under Section 302 of SOX. The study has four main objectives. First, I investigate whether firms that report MW are associated with less effective audit committees and boards of directors. Using 184 firms that reported MW from August 2003 to December 2004 and a matched-pair sample of control firms, I find that firms with lower audit committee financial expertise, smaller audit committees, and lower board independence are more likely to have MW. Second, I examine whether the managerial labor market imposes penalties on top management, audit committees, and boards of directors for internal control failures. I find that MW firms have significantly higher turnover of their audit committee members and outside directors than the control firms following the MW detection. Audit committee members and outside directors in the MW firms also lose more outside directorships than their counterparts in the control firms. There is some empirical support that the top management in the MW firms is more likely to leave the firm than their counterparts in the control firms. Additional analyses show that the extent of reputational penalties increase with the severity of the MW detected. Third, I examine whether the MW firms improve their governance structures upon the MW detection. The results indicate that MW firms experience greater improvement in their governance structures than the control firms. By the second year following the MW detection, the MW and control firms no longer differ in terms of audit committee

independence, audit committee financial expertise, audit committee size, and board independence. Last, I examine whether the market reacts positively to the improvement in governance structures. I find a positive relation between the two-year buy-and-hold abnormal returns and the MW firms' improvement in audit committee size and board independence. This result is consistent with the improvement in governance structures restoring investor confidence in financial reporting.

CHAPTER 1

INTRODUCTION

Recent corporate scandals have suggested a breakdown in internal controls and the lack of adequate corporate governance mechanisms. In an attempt to restore public confidence in financial reporting, the U.S. Congress passed the Sarbanes-Oxley Act (SOX) in October 2002. The Act has been widely considered as the most important corporate reform since the 1930s, and includes widespread provisions targeting corporate internal controls, firms' corporate governance structures, and nonaudit services provided by external auditors, to name a few. Perhaps one of the most controversial provisions of SOX is the internal-controls reporting requirements under SOX 302 and SOX 404. The arguments raised center around the costs and benefits of this provision.

SOX 404 requires management to acknowledge its responsibility for establishing and maintaining adequate internal controls, including asserting their effectiveness in writing.[1] The auditor associated with the financial statements in turn must attest to management's assertion about the effectiveness of internal controls and give an opinion on the effectiveness of the internal controls (SEC Release Nos. 33-8238 and 34-47986). In addition, SOX 302 requires that management evaluate the effectiveness of disclosure

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[1] An accelerated filer (a U.S. company with market capitalization over $75 million that has filed at least one annual report with the SEC) was required to comply with the SOX 404 requirements for its first fiscal year ending on or after November 15, 2004. A non-accelerated filer, including a foreign private issuer, must begin to comply for its first fiscal year ending on or after July 15, 2007.

and control procedures, report results of the evaluation, and indicate any "significant changes" in internal control since the last Form 10-K or Form 10-Q filed (SEC Release Nos. 33-8124 and 34-46427).

Underlying the internal-controls reporting requirements is the belief that strong internal controls help ensure the credibility of financial reporting and restore investor confidence in financial reporting. The assumption that internal control deficiencies lead to fraudulent financial reporting is supported by anecdotal evidence. In 1999, the Committee of Sponsoring Organizations of the Treadway Commission (COSO), commissioned a study and reasserted that a poor internal control environment contributed to the occurrences of fraud documented over the ten year time frame 1987-1997, consistent with the fraud surveys conducted by KPMG. SEC Chairman Issac Hunt Jr., in his speech in 1999, also noted that 'internal control deficiencies were undermining the financial reporting system." (Hunt 1999). Given the importance of internal controls over financial reporting, it is important to understand what mechanisms ensure effective internal controls (Krishnan 2005) and the consequences of the internal-controls reporting requirements.

The first objective of this study is to examine the relation between firms' governance structures and internal control quality. Within large corporations, agency problems arise due to the separation of ownership and control. One way the audit committee and the board of directors resolve agency problems is through superior oversight and monitoring of internal controls. Hence, I hypothesize a positive relation

between the effectiveness of the audit committee and board of directors, and the quality of the firm's internal controls. Because the incidence of material weaknesses (MW) is a reflection of lower quality internal controls, I expect the effectiveness of the audit committee and the board to be negatively related to the incidence of MW.

I measure the effectiveness of the audit committee by its independence, financial expertise, size, and diligence. The effectiveness of the board is measured by its independence, size, diligence, and the duality of its CEO and Chairman positions. I use Compliance Week, *AuditAnalytics*, and the sample firms in Doyle et al. (2007a) to identify firms that disclosed at least one MW from the period August 2003 to December 2004. These MW firms are then matched to a sample of control firms without internal control problems based on size, industry, exchange listing, and accelerated-filer status. A logistic regression model is then used to test the relation between the effectiveness of the audit committee and board, and the incidence of MW.

The regression results are consistent with my expectations. I find that in the year prior to the MW detection, firms with less effective audit committees and boards are more likely to have MW. Specifically, firms with a lower proportion of audit committee members with accounting financial expertise,[2] smaller audit committees, and a lower proportion of board members who are independent, are more likely to be related to the incidence of MW. There is also some empirical support that firms with a lower

[2] Accounting financial expertise refers to experience as a public accountant, auditor, principal or chief financial officer, controller, or chief accounting officer.

proportion of audit committee members with nonaccounting financial expertise[3] are more likely to have MW. These results are consistent with the interpretation that both the audit committee and the board play an important role in the monitoring of internal controls.

The second objective of this study is to examine whether there are reputational penalties imposed on top individuals, i.e. top management, audit committee members, and outside directors on the board, when monitoring of internal controls fails. If so, disciplinary actions can provide strong ex-ante incentives for these individuals to be effective monitors. Empirical evidence provides support that such disciplinary actions are effective when poor financial performance or fraud ensues (Desai et al. 2006, Warner et al. 1988), but there has been no research examining the penalties related to weak internal controls. This study fills this void by examining whether these top individuals face reputational penalties upon MW detection.

The empirical results are consistent with top management, audit committees, and outside directors facing reputational penalties upon MW detection. Specifically, I find that the audit committee members and outside directors in the MW firms experience turnover at a rate greater than their counterparts in the control firms. This result is robust even after controlling for other factors that may affect the turnover of these individuals,

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[3] Nonaccounting financial expertise refers to the experience as a CEO, president, general partner, or managing director of a for-profit corporation. The definition of "financial expertise" in the earlier version of SOX included only the formal definition of expertise, but the final version of SOX was expanded to include both definitions. A detailed discussion on the financial expertise of the audit committee can be found in Chapter 4.1.1 of this study.

such as poor financial performance. I also find that audit committee members and outside directors of the MW firms lose more outside directorships in other public companies than their counterparts in the control firms. This result is consistent with the labor market inferring the lower quality in monitoring associated with these individuals and imposing further reputational penalties as a result. There is also some empirical support that the top management in the MW firms is more likely to leave the firm than their counterparts in the control firms. Last, further tests show that the turnover of audit committee members and outside directors, and the loss in their outside directorships, increase with the severity of the MW detected. Overall, the results provide empirical support for the labor market penalties associated with internal control failures.

Firms may perfunctorily change their top individuals to recover lost reputational capital or to limit the liabilities that arise from these internal control weaknesses. Merely replacing an ineffective manager or director with another ineffective individual will not result in an overall improvement in firms' governance structures. Hence, the third objective of this study is to examine whether MW firms improve their corporate governance structures upon detection of such weaknesses. Examining whether the governance structures for these firms improve is important, given that these firms are more susceptible to frauds and/or financial statement errors, and are of much concern to regulators and the investing public. Improvement in governance structures can also be seen as tangible benefits accruing to stakeholders of weak firms that can potentially justify the high costs involved in the internal-controls reporting requirements of SOX.

The empirical results show that while both the MW firms and control firms improve their governance structures from the year prior to the MW detection to the second year following the MW detection, the MW firms show more improvement in their audit committee independence, audit committee accounting financial expertise, audit committee size, and board independence. Using a composite measure to capture the overall improvement in governance structures, I also find that the MW firms show greater overall improvement in the effectiveness of their audit committees and boards than the control firms. In fact, in the second year following the MW detection, the MW firms and control firms no longer exhibit differences in their audit committee independence, audit committee accounting financial expertise, audit committee size, and board independence. These results are consistent with the MW firms' attempts to restore investor confidence, reestablish reputational capital, recover stock performance, etc., through the improvement of their governance structures.

The last objective of this study is to examine whether for the MW firms, the improvement in corporate governance structures are capitalized in long-run buy-and-hold returns. Existing studies have shown that firms with internal control weaknesses suffer a short-term decline in stock price or increase in cost of capital, suggesting that market participants discount the credibility of financial reports of these firms. If investors indeed perceive the improvement in governance structures as resulting in better monitoring by the audit committee and the board, they are likely to have greater confidence in the firm's financial reporting and react positively to the improvement in governance structures.

Given this, we can expect a reversal of long-run stock price reaction for firms that improve their governance structures.

The empirical results are consistent with this expectation. Specifically, among the sample of MW firms, I find a positive relation between the improvement in audit committee size and board independence, and the two-year buy-and-hold abnormal returns. Hence, the market reacts as if they believe that the increases in audit committee size and board independence in the MW firms improve the firms' financial reporting quality. This evidence provides empirical support that the internal-controls reporting requirements help to restore investor confidence in firms' financial reporting, which is fundamental to maintaining the stability of the capital market as a whole.

The rest of this study is organized as follows. Chapter 2 provides the background to the internal-controls reporting requirements and the related literature on internal control reporting. Chapter 3 develops the hypotheses, and Chapter 4 discusses the research design and the sample used in the study. Chapter 5 presents the empirical results. Chapter 6 concludes and discusses the contributions and limitations of this study.

CHAPTER 2

BACKGROUND AND RELATED RESEARCH

2.1 Institutional Background and Reporting Environment

Even before SOX had been passed, the SEC, Congress, and private sector organizations such as the Financial Executives Institute (FEI) and the Institute of Internal Auditors (IIA) recommended mandatory management internal control reports as a means to improve the reliability of financial statements. The SEC attempted to obtain approval in 1978 and 1991 that would have required mandatory internal control reports by all public companies, but met with little success. Furthermore, some public and private sector groups also recommended auditor attestation on management internal control reports, but failed prior to SOX.

Although there has not been a mandatory requirement for internal control reporting prior to SOX, two important documents have been issued that provide guidance. First, the Committee of Sponsoring Organizations of the Treadway Commission (COSO) (1992) issued Internal Control – Integrated Framework, which provides a high-level overview of the internal control framework to guide chief executive and other senior executives, board members, legislators and regulators. It defines internal control as a process, effected by an entity's board of directors, management and other personnel, designed to provide reasonable assurance regarding the achievement of objectives in the effectiveness and efficiency of operations, reliability of financial reporting, and compliance with laws and regulations. The report also provides guidance

to those entities that report publicly on internal control over preparation of their published financial statements, or are contemplating doing so, and provides materials that may be useful in conducting an evaluation of an internal control system.

One year later in 1993, the Auditing Standards Board issued Statements on Standards for Attestation Engagement (SSAE) No.2, Reporting on an Entity's Internal Control Structure over Financial Reporting. Similar to COSO, SSAE No. 2 restricts its scope to reporting on internal control over financial reporting. SSAE also provides guidance on the definition of internal controls and the types of auditor reports that may be issued based on the auditor's examination of the internal control structure.

The downfalls of Enron and Arthur Andersen, and the Worldcom saga provided the impetus for more stringent requirements on internal control disclosure and reporting. According to the Public Company Accounting Oversight Board (PCAOB), the series of corporate scandals that began with Enron in late 2001 exposed serious weakness in the system of checks and balances. Such checks and balances are fundamental to protecting the interests of shareholders, pension beneficiaries, and employees of public companies, and to protecting the confidence of the American public in the stability of U.S. capital markets. The Congress subsequently responded to the corporate failures with SOX of 2002. The Act created a broad and new oversight regime for auditors of public companies while prescribing steps to address specific failures and codifying the responsibilities of corporate executives, corporate directors, lawyers and accountants.

Failures in internal control, particularly over financial reporting, were among the specific concerns addressed by Congress in SOX.

Specifically, SOX 404 requires not only that management report on a company's internal control over financial reporting, but also that auditors attest to the accuracy of management's report and provide their own opinion on the internal controls. This provision is generally effective for fiscal years ending on or after June 15, 2004, but the date was subsequently postponed to November 15, 2004. In addition, SOX 302 requires that management evaluate the effectiveness of disclosure and control procedures, report results of the evaluation, and indicate any "significant changes" in internal control since the last Form 10-K or Form 10-Q filed (SEC Release Nos. 33-8124 and 34-46427).

The bottom line for Congress, and for the PCAOB, is the reliability of the company's financial statements – statements that are relied on by shareholders, employees, directors, regulators, lenders, investors and the market at large. The Congress and PCAOB both hold the view that good internal controls are necessary to achieve reliability of financial statements. Investors can have much more confidence in the reliability of financial statements if management demonstrates that it exercises adequate internal control over accounting, maintains sufficient records for the preparation of accurate financial statements, adheres to rules about the use of company assets and takes measures against the possibility of misappropriation of company assets.

2.2 Early Research on Internal Controls

Despite the importance of internal controls, relatively little empirical research has been conducted on internal controls prior to the passage of SOX. One reason could be due to the fact that reports on internal controls were not widely provided by firms, limiting research in this area. Reports on internal controls were generally issued on a voluntary basis (Hermanson 2000). An exception is where firms were required to disclose any internal control problems around auditor changes, if in the prior two years internal control problems were one of the "reportable events."

One earlier study by Wallace (1981) examines the internal control reporting practices of municipalities and finds that disclosures of these entities did not answer questions of risk exposure, costs and benefits, or the meaning of the diversity of report forms. Raghunandan and Rama (1994) examine the 1993 annual reports of *Fortune* 100 companies and find that 80 companies had management reports mentioning the existence of internal controls. Only six of these companies discussed the effectiveness of the internal controls. McMullen et al. (1996) compare the proportion of companies with financial reporting problems that have a management report on internal control (MRIC) to the National Automated Accounting Research System (NAARS) population of companies with MRICs. The study finds that smaller companies with financial reporting problems are less likely to have MRICs than the population of small companies in the NAARS database. This result implies that voluntary issuance of MRIC could be

perceived by users as a signal that management has reviewed the internal controls thoroughly.

Hermanson (2000) surveys nine different financial statement user groups to analyze the demand for reporting on internal control. The results of the study show that all user groups feel that internal control reporting is important and that voluntary MRICs improve controls and provide additional information beyond the audited financial statements. However, respondents do not feel as strongly about the informational content of mandatory MRICs. McMullen and O'Reilly-Allen (2002) extend the study of Hermanson (2000) to determine if management and auditor reporting on internal control affect the perceived reliability of the financial statements. In their study, participants are given a case study and then asked to respond to a series of questions, which examine their perceptions of the financial statement reliability. The results of the study indicate that users' perceptions do not appear to be affected by the inclusion of an MRIC or Auditor Report on Internal Control (ARIC). However, as highlighted by the authors, because the study consists of a case study, there are limitations on the external validity of these results.

2.3 Recent Research on Internal Controls

The series of corporate scandals has exposed weaknesses in checks and balances that were intended to protect the public's interests. The passage of SOX further highlights the attention regulators give toward internal controls as a means to improve financial reporting and regain the public's confidence. These emphases on internal

controls have generated much research, specifically on the characteristics of firms with weak internal controls and the consequences of weak internal controls. Because this study focuses on examining whether corporate governance structures are associated with weak internal controls, and how the revelation of weak internal controls affect firms' governance structures, I review existing studies that are related to this study.

One stream of research examines whether firms that report internal control problems subsequent to the passing of SOX are associated with certain firm characteristics (Ashbaugh et al. 2007, Ge and McVay 2005, Bryan and Lilien 2005, Doyle et al. 2007a). The underlying assumptions are that certain characteristics could result in internal control weaknesses. Ge and McVay (2005) focus on a sample of 145 companies that have disclosed MW in internal control in their 10-K filings after the effective date of SOX. The authors find that poor internal controls are usually associated with inadequate accounting resources and that disclosing MW is positively associated with the complexity of the firm, and negatively associated with the age and profitability of the firm. Bryan and Lilien (2005) also find that firms with MW are both smaller and worse performers than their matched industry counterparts. Consistent with these two studies, Doyle et al. (2007a) find that MW are more likely for firms that are smaller, less profitable, more complex, growing rapidly, or undergoing restructuring. The authors conclude that these findings are consistent with firms struggling with their financial reporting controls in the face of a lack of resources, complex accounting issues, or a rapidly changing business environment.

Last, Ashbaugh et al. (2007) find that firms making pre-SOX 404 internal control deficiency disclosures typically have more complex operations, recent changes in organization structure, more accounting risk exposure, fewer resources to invest in internal control and a higher incidence of auditor resignation relative to firms that do not report internal control problems. The study also investigates firms' incentives to discover and report internal control problems, and finds that firms that have internal control deficiencies have more prior SEC enforcement actions and restatements of financial statements, are more likely to use a dominant audit firm, and are more likely to have concentrated institutional ownership. This study differs from these studies in that it examines the link between weak internal controls and governance structures.

Another stream of research looks at whether internal controls are associated with firms' earnings quality. Doyle et al. (2007b) examine the relation between accruals quality and internal controls using a sample of 653 firms that disclosed at least one MW from August 2002 to November 2005. The study finds that firms with MW tend to have lower accruals quality, as measured by the extent to which accruals are realized as cash flows. In addition, accruals quality is especially poor for those MW that relate to overall company-level controls, which may be more difficult to "audit around." These results are robust to four additional accruals quality measures: discretionary accruals, earnings persistence, average accruals quality, and historical accounting restatements. The authors conclude that internal control appears to be an underlying, fundamental driver of accruals quality, with weaknesses indicating poorly estimated accruals that are not realized as cash flows.

Ashbaugh et al. (2006a) investigate both the effect of internal control deficiencies and their remediation on accrual quality. The authors document that, relative to firms not reporting internal control deficiencies, firms that report internal control deficiencies have lower quality accruals. Further, firms that report, and their auditors confirm, remediation of previously reported deficiencies exhibit an increase in accrual quality, while those firms that fail to remediate deficiencies continue to exhibit poorer accrual quality relative to non-deficiency firms. The authors conclude that consistent with assertions by market regulators, strong internal controls have significant effects on the reliability of financial reporting. This study complements the above studies by examining how internal control weaknesses affect the governance structures of the firms with these weaknesses.

The last major stream of research examines the consequences of internal control weaknesses by examining the market's reaction to disclosure of these weaknesses. These studies produce mixed results. Whisenant et al. (2003) investigate the information content of reportable events communicated by auditors in Form 8-K filings, including those identifying internal control deficiencies, and find that disclosures of control deficiencies have no negative stock price reaction. In contrast, Hammersley et al. (2006) examine the market's price and volume reactions to management's disclosure of internal control weaknesses and to their characteristics. The study finds that returns are significantly negative when MW are disclosed, and more negative when management claims that the control system is effective, despite the presence of a MW. The study also finds increased trading volume when internal control weaknesses are disclosed. The

authors conclude that the results suggest that these disclosures provide information to market participants. Specifically, returns results are consistent with investor concerns about the expense necessary to remediate weaknesses or the possibility that uncorrected errors remain in the financial statements. Trading volume results suggest that disclosure of an internal control weakness generates investor disagreement about the firm's future prospects.

Emanuels et al. (2006) also examine market returns around the disclosure of internal control problems by public firms. Using all companies reporting deficiencies or weaknesses in the internal controls for the period November 2003 up to December 2004, they find that there are significant negative abnormal returns in the period prior to the disclosure event and that these returns around and subsequent to the disclosure are much smaller. Partitioning the sample of firms, they find that problems related to staffing issues have no significant effect on stock returns in the post event window, i.e. after the disclosure. Problems related to financial reporting complexity lead to a significant decrease of the average abnormal returns in the post-event window. Last, Beniesh et al. (2006) also find that firms disclosing internal control weaknesses experience negative abnormal returns of -1.8 percent in the three days surrounding disclosure.

Instead of examining market reaction, a few studies examine whether disclosures of internal control weaknesses cause the market to assign a higher cost of capital to the firm. Ashbaugh et al. (2006b) use unaudited pre-SOX 404 disclosures and SOX 404 audit opinions to assess how changes in internal control quality affect risk and the cost of

equity capital. After controlling for other risk factors, the authors find that firms with internal control deficiencies have significantly higher cost of equity capital. However, they document that the remediation of an internal control deficiency is followed by a significant reduction in the cost of equity capital (ranging from 50 to 150 basis points) depending on the analysis.

Ogneva et al. (2006) examine the association between implied cost of equity and internal control effectiveness for firms that filed SOX 404 reports with the SEC and also for firms that disclosed internal control problems under SOX 302. They find marginally higher cost of equity for firms disclosing MW in internal controls than for a sample of control firms disclosing no MW. However, the differences in cost of equity disappear after controlling for other economic characteristics associated with firms disclosing MW. The authors also find evidence that the costs of equity are significantly higher for a small sample of firms that delayed their SOX 404 disclosures. Last, Beneish et al. (2006) find support for the belief that firms with internal control weaknesses are perceived to have lower credibility in financial reporting. Specifically, the authors find that the costs of capital of these firms increased on average by 4.4 percent, when compared to three alternative control samples matched on industry and either size, performance, or an earnings quality measure.

This line of research examines the first order effect of internal control weaknesses on the market's reaction. This study seeks to complement these studies by examining the second order effect of internal control weaknesses on the capital market's reaction.

Specifically, the study examines how internal control weaknesses affect corporate governance structures, which in turn affects the capital market's reaction.

CHAPTER 3

HYPOTHESIS DEVELOPMENT

3.1 Relation between Internal Control Quality and Corporate Governance Structure

3.1.1 Monitoring of Internal Controls by the Board of Directors

The findings that weak internal controls result in lower accruals quality and negative stock market reaction lend support to the regulators' emphasis on internal controls to improve financial reporting quality. Weak internal controls, especially if disclosed and allowed to persist, can undermine users' perception of the credibility of the firm's financial reporting and harm the firm in the long run. Despite the importance of internal controls, research on what corporate governance mechanisms can ensure effective internal controls is scant.

Fama and Jensen (1983) contend that boards assume an important role in corporate governance. The modern large corporation is characterized by the absence of the classical entrepreneurial decision maker. Instead, in order to reap the benefits of risk sharing, the company's residual claims are diffused among many investors, who generally vest their decision rights in individuals with specialized knowledge. Agency theory predicts that such delegation of decision to management creates conflicts of interests between managers and residual claimants. Agency costs are created because the managers who initiate and implement important decisions are not the major residual claimants and therefore do not bear a major share of the wealth effects of their decisions. Without effective control procedures, such managers are likely to take actions that

deviate from the interests of residual claimants. For instance, managers can manipulate financial reports or commit fraud to maximize their own self-interests, and to the detriment of shareholders.

Fama and Jensen (1983) argue that agency costs can be reduced by institutional arrangements that separate decision management from decision control. Separate decision control is required to monitor the actions of the top managers, i.e. CEO or president, approving the corporation's strategy, and monitoring the control systems of the firms. Within the large corporations, decision control rights are delegated to the board, which represents the highest level of decision control. The board helps to reduce conflicts of interests between managers and residual claimants and ensure that management decisions are congruent with shareholders' interest.

Effective internal controls are part of the firm's overall control system that can be used to mitigate agency conflicts and curb managers' opportunistic behavior (Jensen and Payne 2003). A sound financial reporting system prevents managers from using aggressive accounting to inflate earnings and/or stock price, and effective internal controls are essential in ensuring the integrity of financial reporting system. For instance, the maintenance of proper accounting policies and procedures and adequate controls over non-routine transactions reduce ambiguities in the interpretation of accounting procedures. In turn, this can prevent managers from manipulating accounting rules to maximize their self-interests. Proper internal controls over financial statement

closing procedures, timely preparation of account reconciliations, and account analysis all seek to reduce errors in financial accounting, thus ensuring accurate financial reporting.

Effective internal controls such as the hiring of accounting personnel with high levels of accounting expertise and technical competence with financial accounting standards or SEC filing requirements can enhance the quality of accounting information (Jensen and Payne 2003). For instance, accounting personnel with high levels of accounting expertise are more likely to capture and report relevant financial information useful for decision making and prepare financial statements in conformance with generally accepted accounting principles (GAAP) for external parties. Highly competent and/or experienced accounting personnel are also better able to understand complex accounting issues and deal with non-routine accounting transactions.

Another important internal control that curbs managers' opportunistic behavior is the internal audit function. Many of the responsibilities of internal auditors are linked directly to the production and monitoring of accounting information. One of them is to test, evaluate, and make recommendations regarding an organization's accounting system and internal controls over financial reporting. By doing so, internal auditors reduce the risk of fraud and protect assets from theft or loss, thus ensuring that accounting information generated by the firm is less susceptible to errors.

The above discussions highlight the importance of internal controls as a monitoring mechanism that the board uses to reduce agency conflicts and managers'

opportunistic behavior. Reputational concerns provide additional incentives for the board of directors to play a vigilant role in the monitoring of internal controls. Fama (1980) and Fama and Jensen (1983) contend that outside directors are generally high-reputation members of the business community who view the directorate as a means of further developing their reputations as experts in decision control. Directors who demonstrate their superior ability in decision control are rewarded through additional directorships and prestige. Hence, directors have incentives either to protect or enhance their reputational capital. Because weak internal controls are likely to result in lower financial reporting quality (Ashbaugh et al. 2006a, Doyle et al. 2007b) and harm the directors' reputation, the board is likely to play a vigilant role in the monitoring of internal controls and financial reporting.

3.1.2 Monitoring of Internal Controls by the Audit Committee

It is common for the board to delegate duties to a subset of the board. The extant literature suggests that the board faces litigation risks for monitoring failures and that directors can mitigate their liability through formation of an effective audit committee. Reinstein et al. (1984) posit that outside non-audit committee directors may be able to demonstrate fulfillment of their fiduciary duties by stating that they relied upon audit committee representations on issues regarding the adequacy of the firm's financial reporting and the audit committee's relationship with the external auditors. As such, non-audit committee directors effectively shift some of the risk of potential financial misstatement to the audit committee (Abbott et al. 2003). Consequently, audit committees would seek to mitigate risk by diligently performing oversight of the firm's

accounting functions. Studies with findings consistent with the quality of the audit committee being associated with financial reporting outcomes include Carcello and Neal (2003a) and Klein (2002b). Because internal controls over financial reporting might affect financial reporting outcomes, it is expected that more effective audit committees will seek to produce favorable financial reporting outcomes by maintaining effective internal controls.

Further, the profession and regulators are both of the view that one of the duties of the audit committee should be to ensure effective internal controls. The Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees (1999) recommends that the audit committee encourage procedures that promote accountability and ensure that management properly develops and adheres to a sound system of internal control. The Commission on Public Trust (2003) advocates the requirements of SOX that "….the audit committee be responsible for the appointment, compensation, and oversight of the work of the auditors, and that the outside auditors and internal auditors report directly to the audit committee." Under SOX 301, audit committees of public companies are required to establish procedures for the "receipt, retention, and treatment of complaints" regarding accounting, internal controls, and auditing.

The importance of the audit committee's role in the oversight of the firm's internal control system has also been highlighted by researchers. DeZoort (1997) surveys audit committee members to elicit perceptions of their responsibilities in areas related to financial reporting, auditing, and overall corporate governance. Members consistently

rank internal control evaluation as the most important oversight area, with financial statement review and internal auditor/external auditor evaluation considered highly important. Hence, the audit committee is expected to play an important role in monitoring internal controls besides the board of directors.

3.1.3 Effectiveness of Governance Structures and Internal Control Quality

Studies have shown that more effective boards and audit committees are associated with stronger corporate governance. Dechow et al. (1996) and Beasley (1996) both find that firms with weak corporate governance characteristics, such as a lack of an audit committee, less independent boards, having a CEO who also serves as the Chairman of the board, etc., are more likely to be subject to fraudulent reporting. Klein (2002b) and Xie et al. (2001) find that more effective boards and audit committees, measured by their composition and activity, are associated with higher earnings quality. Last, studies have shown that more effective audit committees are associated with the hiring of external auditors who are more independent (Carcello and Neal 2000) and auditors who have greater industry expertise (Abbott and Parker 2000).

I expect firms with more effective governance structures to have higher quality internal controls. More effective audit committees and boards, comprised mainly of independent directors, are less likely to be influenced by top managers. As such, they are more likely to protect shareholders' interests and implement effective internal controls to curb managers' opportunistic behaviors. High-quality audit committees are more likely to engage in discussions with the internal and external auditors about their assessment of

internal control (Krishnan 2005). They are also more likely to follow up on concerns about the quality of internal controls by eliciting recommendations for improvement and ensuring that management carries out these recommendations. In addition, more effective audit committees or boards have higher levels of accounting and financial expertise that enable them to better understand complex internal control issues, which is important in attempting to achieve an effective overall internal control system. A detailed discussion on how I measure the effectiveness of the firm's governance structure, i.e. the board of directors and audit committee, is found in Chapter 4.1 of this study.

Only two studies directly explore the link between internal control quality and corporate governance structures (Krishnan 2005, Krishnan and Visvanathan 2005). Krishnan (2005) examines a sample of firms disclosing internal control problems surrounding auditor changes during the period 1994-2000. She finds that these firms have audit committees that are more independent and have a higher level of expertise compared to a control sample of firms changing auditors but not disclosing internal control problems. However, because her sample was restricted to firms subject to auditor changes, the results may not be generalizable to all firms. Further, her study is conducted prior to SOX. Recent policy changes are likely to intensify the pressures for firms to improve their corporate governance mechanisms, making it important to examine whether the results in Krishnan (2005) hold in the post-SOX period.

Perhaps more importantly, Krishnan's study is focused on examining the characteristics of the audit committee. However, the effectiveness of the audit committee may depend on board characteristics. For instance, the report of the Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees (1999) states that "audit committee performance relies on the practices and attitudes of the entire board." Beasley and Salterio (2001) find that firms with strong board governance attributes are more likely to voluntarily form audit committees composed of members with relevant financial reporting and audit committee knowledge and experience. Klein (2002a) provides further evidence that audit committee independence increases with board size and board independence. Hence, failure to control for board characteristics when examining the relation between audit committee characteristics and internal control quality can potentially introduce an endogeneity problem in the regression results.

Krishnan and Visvanathan (2005) examine the role of audit committees and auditors in the reporting of internal control deficiencies after the passage of SOX. The authors find that a higher number of meetings of the audit committee, smaller proportion of financial experts in the audit committee, and more auditor changes characterize firms that report weaknesses in their internal controls compared to firms with no weaknesses. Prior restatements are also higher for firms not reporting such weaknesses. However, the study does not find differences in the size of the audit committees between firms with and without weaknesses, and the authors do not examine the independence of the audit committee nor the board characteristics.

Based on the discussions above, I complement Krishnan (2005) and Krishnan and Visvanathan (2005) by hypothesizing that less effective audit committees and boards of directors are associated with lower internal control quality. I examine firms that disclosed MW under SOX 302, which is a more representative sample than that used in Krishnan (2005). By using this sample of firms, I am also able to examine whether the results in Krishnan (2005) hold in the post-SOX period, and whether the results hold when I examine a more comprehensive set of corporate governance characteristics that include both the board and audit committee characteristics. Because the incidence of MW is an indication of lower internal control quality, I expect that firms with less effective audit committees and boards of directors to be more likely to have MW. A summary of all the hypotheses developed in this study can be found in APPENDIX A.

Hypothesis 1: Firms with weaker corporate governance structures, i.e. less effective audit committees and boards of directors, are more likely to have MW.

3.2 Reputational Penalties for Internal Control Failures

Much of the existing research has shown the potential impact of internal control weaknesses on firms' earnings quality and users' perception of the firms' earnings numbers. However, little is known of the impact internal control weaknesses have on the governance structures of firms. As mentioned earlier, the audit committee and the board play an important role in maintaining effective internal controls as a way of monitoring managers' behaviors. Hence, the audit committee and the board should be held accountable for internal control failures. Because labor market forces also extend to top

managers (Jensen and Meckling 1976, Fama and Jensen 1983) and top managers have responsibilities in ensuring effective internal controls under SOX, I also examine whether top managers suffer similar reputational penalties. Failure to remove such individuals when monitoring fails would imply weak corporate governance (DeFond and Hung 2004).

Fama and Jensen (1983) contend that board membership confers benefits to directors and that outside directors are rewarded by the reputation they develop as expert monitors. Specifically, outside directors use their directorships to signal to internal and external markets that (1) they are decision experts, (2) they understand the importance of diffuse and separate decision control, and (3) they can work with such decision control systems. Good performance by board directors has the potential to lead to better opportunities for the directors going forward. On the other hand, Fama and Jensen argue that labor market forces impose disciplinary actions on directors when monitoring fails. Such reputational penalties include not only loss of their board positions, but also extend to the loss of directorships in other firms in which the directors sit on. As such, directors have an ex-ante incentive to be efficient monitors (Srinivasan 2005). Evidence that the labor market imposes reputational penalties on directors for monitoring failures is evident in the following studies.

Gilson (1990) examines disciplinary actions against directors in 111 publicly traded firms that either file for bankruptcy or privately restructure their debt between 1979 and 1985. He finds that on average, only 46 percent of incumbent directors remain

when bankruptcy or debt restructuring ends. Directors who resign hold significantly fewer seats on other boards following their departure.

Srinivasan (2005) uses a sample of 409 companies that announced restatements from 1997 to 2001 to provide evidence on the labor market penalties for outside directors, particularly audit committee members, from financial reporting failure. He finds significantly higher turnover of boards for firms that restate earnings downward, with 48.1 percent of outside directors turning over within three years of the restatement announcement. Further, the likelihood of director turnover increases with the severity of the restatement and is greater for audit committee members than for other directors. Last, for firms that overstate earnings, directors of these firms are no longer present in 25 percent of their positions on other boards.

There have been no studies conducted yet to examine the penalties imposed on audit committee members and outside directors as a result of internal control failures. Although MW in internal controls are less serious than outright fraud, weak internal controls and fraud are closely related (Bell and Carcello 2000). For instance, Bell and Carcello (2000) examine the effectiveness of the risk-factor examples presented in SAS No. 53 at distinguishing between fraud and nonfraud engagements. The authors find that among the risk factors, a weak internal control environment is positively related to the incidence of fraud. In 1999, a study commissioned by COSO found that a poor internal control environment contributed to the occurrences of fraud documented over the ten year time frame 1987-1997. Given that internal control failures could result in frauds, I expect

that internal control failures will exert pressure on the firm to remove ineffective audit committee members and outside directors.

Recent concerns over weak internal controls as leading to poor financial reporting quality and the publicity surrounding several high profile cases (e.g. Enron, Worldcom, etc.) likely heightened the attention of investors and regulators to internal controls. The increased scrutiny by investors and regulators are likely to further intensify a firm's pressures to punish audit committee members and outside directors for internal control failures. As in Srinivasan (2005), I focus only on outside directors rather than the entire board because the academic literature and regulators emphasize the role of these directors in monitoring financial reporting and Fama and Jensen (1983) contend that the risk and rewards of board memberships apply to these directors. Hence, throughout this paper, "outside directors" refer to the directors on the entire board that are not employees of the firm. I expect the reputational penalties imposed on audit committee members and outside directors to include not only the loss of directorships within the firm, but also the loss of outside directorships in other public companies these individuals hold.

Hypothesis 2a: Firms with MW experience greater turnover of audit committee members and outside directors following the MW detection, compared to firms without internal control weaknesses.

Hypothesis 2b: Audit committee members and outside directors in firms with MW lose more outside directorships in other public companies following the MW detection, compared to their counterparts in firms without internal control weaknesses.

Fama (1980) posits the existence of the managerial labor market as managers' principal disciplinary force. According to Fama, "the variability of the large corporation with diffuse security ownership is better explained in terms of a model where the *primary disciplinary action comes through managerial labor markets*, both within and outside of the firm, with the assistance from the panoply of internal and external monitoring devices that evolve to stimulate the ongoing efficiency of the corporate form, and with the market for outside takeovers providing discipline of last resort." Disciplinary actions can be imposed on top managers through their removal from the firm for ineffectiveness, and such actions could influence managerial actions and incentives ex ante (Desai et al. 2006, Agrawal et al. 1999).[4]

Desai et al. (2006) detect severe external labor market consequences for managers of firms charged with aggressive accounting. The authors find that their sample firms that announced earnings restatements in 1997 or 1998 experienced significantly higher turnover of top management, i.e., Chairman, CEO, or President, following the

[4] Gilson (1989) contends that top management, when forced to leave the firm, are likely to suffer possible losses in income and firm-specific human capital, and in any power, prestige, and other non-pecuniary benefits they derived from managing their firms. Management changes also adversely affect managers' reputations if turnover is viewed as a sign of incompetence. Based on this argument, if internal control failures impose costs on managers through the loss of position within the firm, this disciplinary mechanism can provide incentives for managers to avoid internal control failures. The penalty implicit in the managerial labor market may thus help to reduce the costs of monitoring managers within the firm.

restatements than control firms that do not restate earnings. The authors conclude that the corporate boards impose significant penalties on managers for violating GAAP. Agrawal et al. (1999) also find higher managerial turnover in firms discovered to have engaged in fraud in their univariate comparisons, although the results disappear in their multivariate tests.[5]

I expect the labor market to impose similar disciplinary actions on top managers for internal control failures. Although both the board and audit committee have roles in monitoring internal controls, top management is ultimately responsible for establishing and maintaining proper internal controls (Krishnan 2005). Under both SOX 302 and SOX 404, management has to certify that they are "responsible for establishing and maintaining internal controls." Management also has to evaluate the effectiveness of the firm's internal controls and report their conclusions about the effectiveness of their internal controls. Given that internal control failures represent a form of inefficiency on the part of top management in their fiduciary duties, I expect the labor market to impose disciplinary actions on top management following the revelation of internal control weaknesses. Such removal of top management will be consistent with what Fama (1980)

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[5] Beneish (1999) investigates the penalties imposed on managers for firms that engaged in earnings overstatements that are subject to accounting enforcement actions by the SEC. The results are consistent with Agrawal et al. (1999) in that the managers' employment losses subsequent to the discovery of earnings overstatement are not different from firms that do not engage in such overstatements.

termed as "monitoring devices that evolve to stimulate the ongoing efficiency of the corporate form."[6]

Hypothesis 2c: Firms with MW experience greater turnover of top managers, i.e. CEO, Chairman, or President, compared to firms without internal control weaknesses.

Srinivasan (2005) finds that the likelihood of director departure and the director's loss in positions on the board of other firms increases with severity of the accounting restatement. This result provides empirical support that the reputational penalties imposed on the directors depend on the extent of monitoring failure. Internal control problems also vary widely according to their severity and underlying reason, and Doyle et al. (2007a) contend that it is important for future research on internal controls to consider this variation.

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[6] Increased shareholder activism may provide further impetus for firms to remove ineffective top management upon internal control failures. According to Holmstrom and Kaplan (2001), there has been a trend of increasing shareholder activism in the United States since the 1980s. One reason for the increasing shareholder activism is the 1992 SEC's ruling that substantially reduced the costs to shareholders of mounting proxy contests that challenged management teams. Under the newer rules, shareholders can essentially communicate at any time in any way as long as they send a copy of the substance of the communication to the SEC, thus reducing the cost of coordinating shareholder actions and of blocking management proposals. Further, there has been a trend of increasing institutional ownership. According to the Board of Governors of the Federal Reserve System (2003), institutional investment in the United States grew from 6.1 percent of aggregate ownership of equities in 1950 to over 50 percent by 2002. Institutional shareholders are increasingly engaged in corporate governance activities, introducing proxy proposals and negotiating with management, with a goal of improving performance (Romano 2001). Hence, as shareholder activism and institutional owners' involvement in firms' corporate governance become more pronounced, I expect an increase in the propensity for firms to oust top management for internal control failures.

Doyle et al. (2007a) explore the determinants of internal control problems, classified by whether they are account-specific weaknesses or company-level weaknesses.[7] The results show that firms that report account-specific weaknesses tend to be larger, older, financially healthier, more complex, and growing more rapidly than firms that report company-level weaknesses. In contrast, firms with company-wide problems seem to lack the resources or experience to maintain comprehensive control systems. In another study, Doyle et al. (2007b) find that the relation between weak internal controls and lower accruals quality is driven by weakness disclosures that relate to overall company-level controls, which may be more difficult to "audit around," but not by auditable, account-specific weaknesses.

Based on the results in the above studies, I examine whether the extent of labor market penalties imposed on top management and the directors depend on the severity and pervasiveness of the MW detected. If top management, audit committee members, and outside directors are held accountable for internal control failures, then the likelihood of reputational penalties being imposed on these individuals should also vary depending on the seriousness of the MW. Weaknesses that are more severe and pervasive should reflect a greater extent of monitoring failure, which in turn increases the likelihood of these individuals facing greater disciplinary actions. For example, consider the following MW disclosed by two different companies:

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[7] The classification scheme is based on Moody's, which posits that account-specific weaknesses are auditable, and company-level weaknesses are more difficult to audit around and call into question not only management's ability to prepare accurate financial reports but also its ability to control the business.

> Our independent auditors, in connection with their audit of our 2003 financial statements, have noted certain matters involving our internal control and its operation in connection with *the improper recording of workers' compensation liabilities and operating leases* in the periods affected by the restatements that they consider to be reportable conditions under standards established by the American Institute of Certified Public Accountants and have advised us that, in their judgment, the reportable conditions constitute a material weakness under such standards. (Health Net Inc., 12/31/03 10-K)
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> As set forth in Item 8 of this Annual Report, E&Y issued an unqualified opinion with respect to the financial statements for the fiscal year ended March 31, 2004. However, in connection with its fiscal year end audit procedures, E&Y reported to management and to the audit committee that the combination of identified reportable conditions under standards established by the American Institute of Certified Public Accountants, internal control deficiencies at the Company relating primarily to the *internal control environment, the risk assessment process and the monitoring process that assesses the quality of the Company's internal control performance*, which have been separately reported to the audit committee, and year-end audit adjustments constitute a material weakness in the Company's internal control over financial reporting. …The Company is taking actions to permit it to comply timely with Section 404 of the Sarbanes-Oxley Act ("SOX") in respect of its internal control over financial reporting for fiscal year 2005, including the engagement of another independent accounting firm to assist it with respect to SOX 404 compliance measures, has added additional accounting resources, *plans to establish an internal audit function reporting to the audit committee* and will take such other remedial measures that may be recommended by the audit committee. (Black Box Corporation, 3/31/04 10-K)

The MW detected by Health Net Inc. relate to the incorrect recording of specific account balances. This type of weakness does not appear to be severe because they can be easily corrected by management or "audited around" by the external auditor (for example, by performing more substantive tests). The weakness also does not appear to be pervasive because it only affects one category of weakness, which is the failure in the application of accounting rules. Given this, we are not likely to expect the weakness to be severe or pervasive enough to trigger reputational penalties on those individuals charged with monitoring internal controls.

In contrast, the MW detected by Black Box Corporation relate to the overall internal control environment, the risk assessment process, the monitoring processes, and the internal audit function. These weaknesses appear to be more severe because they pertain to company-level controls and may also call into question the management's ability to prepare accurate financial reports. The weaknesses are also not easily corrected by management or "audited around" by the external auditor. For instance, it may be difficult for the external audit to compensate for the lack of internal audit function by conducting additional substantive tests. The weaknesses in Black Box Corporation are also considered pervasive because they affect a greater number of categories of weaknesses, e.g. insufficient or non-existent internal audit function, insufficient management review, inadequate control procedures, etc. The fact that more categories of weaknesses are detected would suggest a greater degree of monitoring failures by top management, audit committee members, and outside directors on the board. As such, we can expect a greater likelihood of turnover of these individuals and a greater loss of outside directorships for the audit committee members and outside directors. A more detailed discussion on how I determine the severity and pervasiveness of the MW detected is found under Section 4.4 of this study.

Another aspect of MW that may affect the extent of reputational penalties imposed on those charged with monitoring internal controls is the persistence of the MW. Internal control problems persist when they are detected and are not remediated promptly. The remediation of internal control problems is important because persistent

weaknesses further expose the firms to the risk of fraud and financial misreporting. For instance, Ashbaugh et al. (2006a) find that firms that remediate internal control weaknesses experience an improvement in earnings quality while those that fail to remediate do not. Further, Moody's has maintained that the existence of ongoing and uncertain internal control problems with financial reporting can trigger negative rating action against the firm (Moody's 2006). This further suggests that the prompt remediation of internal control problems is necessary to restore confidence in financial reporting. Given the negative effects associated with the persistence of internal control weaknesses, it may be possible that firms have greater incentives to remove ineffective individuals when the MW persist.

While the discovery of any MW itself would point to a monitoring failure, the prompt remediation of MW can provide the opportunity for top management, audit committee members, and outside directors to "redeem" themselves and to regain investors' trust in their monitoring responsibilities. For instance, in the case of Black Box Corporation mentioned earlier, although the MW were considered severe, they were remediated promptly and even before the first SOX 404 report was issued. As such, the prompt remediation demonstrates the superior ability and commitment of top management, audit committee members, and outside directors in maintaining high quality financial reporting. On the other hand, unremediated internal control problems would create more negative sentiments toward those charged with monitoring internal controls, because they reflect a lack of commitment by these individuals, which can intensify the pressure for their removal.

Firms with more persistent weaknesses are also more likely to have less effective audit committees and boards. Goh (2006) finds that firms with audit committees that have greater financial expertise and boards that are more independent, are more likely to remediate MW faster. The lack of financial expertise of the audit committee members and the lack of independence of the outside directors in firms with persistent weaknesses would increase the likelihood of these individuals leaving the firm. Following Goh (2006) and Ashbaugh et al. (2006a), I use the auditor's opinion on the effectiveness of internal controls in the SOX 404 reports to determine the persistence of the MW. A more detailed discussion on how I measure persistence of MW is found in Section 4.4 of this study. Given the above discussions, it is hypothesized as follows:

Hypothesis 3a: Firms with more severe, pervasive, and persistent MW experience greater turnover of top managers, audit committee members and outside directors following the MW detection.

Hypothesis 3b: Audit committee members and outside directors of firms with more severe, pervasive, and persistent MW lose more directorships in other firms following the MW detection.

3.3 Improvement in Corporate Governance Structure

The discussion in the preceding section has focused on turnover of top managers and directors as a result of internal control failures. However, the removal of these

individuals may not necessarily produce the desired benefits (i.e., restoring shareholders' confidence, recovering reputational capital, reducing legal liability, etc.) if these directors are replaced by equally ineffective directors. For instance, ousting an inside director after the MW detection, and merely replacing this director with another insider may not improve the overall governance structure (Farber 2005). Further, it is also likely that shareholders may see such attempts as purely cosmetic, further thwarting the firm's attempt to restore investor confidence. Hence, it is important to examine whether upon the MW detection, these firms not only punish top management by removing them from the firm, but also improve overall corporate governance structures. A priori, I expect firms to improve their corporate governance structures upon the MW detection, as discussed below.

Agrawal et al. (1999) argue that fraud not only can alter the net benefits of managerial turnover, but it can also change the optimal structure of the board. New board members can bring with them reputational capital that has relatively high value, especially among the firm's investors or suppliers, following fraud. Because one board function is to monitor the performance of top managers (Fama and Jensen 1983), the discovery of fraud may reveal a failure by the board to monitor managers effectively. As such, a management change upon a fraud discovery can increase the net returns to managerial oversight, increasing the value of new board members' services, particularly independent members.

In a similar vein, if internal control failures reveal the ineffectiveness of the board or audit committee to ensure managers maintain effective internal controls, the firm will enjoy increased net returns to managerial oversight through the improvement of the effectiveness of the board or audit committee. Further, just as for fraud, negative publicity is likely to ensue following publicity of internal control failures, prompting the firm to find ways to recover lost reputation capital (Agrawal et al. 1999). The improvement in the effectiveness of corporate governance structure can be a way for the firm to reinvest in and attempt to reestablish the firm's reputation capital.

As mentioned earlier, existing studies have shown that firms experience declines in stock prices when MW are disclosed (Emanuels et al. 2006, Hammersley et al. 2006). As such, improvement in governance structures may also help the firm to recover its performance (Agrawal et al. 1999). For instance, Rosenstein and Wyatt (1990) document small positive mean abnormal returns over a two-day window centered on the announcement dates of outside director appointments. Farber (2005) finds a positive and economically significant relation between increases in board independence and long-run buy-and-hold abnormal returns over the three year period following fraud detection. To the extent that governance structure improvements help signal the firm's commitment to restoring effective internal controls and improving financial reporting quality, I expect firms to have strong incentives to improve their governance structures upon revelation of internal control weaknesses. Further, improving the governance structures also helps to limit the firm's legal liability resulting from either a failure to ensure effective internal controls or a sharp stock price decline triggered by such internal control failure.

The only study that examines the improvement of governance structures upon financial reporting failures is Farber (2005). Farber (2005) examines corporate governance changes for a sample of 87 firms identified by the SEC as fraudulently manipulating their financial statements. He finds that while fraud firms' governance structures are initially weak, by the end of a three-year period following the year of fraud detection these firms have a similar board of director profile and proportion of firms with the combined CEO and Chairman position to that of their matched control firms. He also finds that fraud firms hold more audit committee meetings than their matched control firms by the end of this same period. Overall, the results of his study suggest that improving the quality of governance is important to fraud firms.

The recent high profile corporate failures and focus on internal control breakdowns likely heightened the public's attention toward firms' governance structures. Given this, firms across the board are likely to improve their governance structures and it is necessary to compare the improvement in the governance structures of the MW firms relative to the control firms. If the MW firms have greater incentives to improve their governance structures than the control firms for the reasons stated above, then we can expect the MW firms to show improvement in their governance structures relative to the control firms.[8] Hence, it is hypothesized as follows:

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[8] Readers may feel that because the MW firms started off as having weaker corporate governance structures, they may have more room for improvement than the control firms. This ceiling effect likely works in the direction of the hypothesis, and is a limitation of the study that is further explained in the

Hypothesis 4: Corporate governance structures, i.e., effectiveness of the audit committees and boards of directors, of the MW firms improve upon the MW detection, when compared to the control firms.

As discussed earlier, firms with MW have incentives to improve their governance structures in order to increase the value of new board members' service, to recover lost reputation capital, and to recover stock performance. Hence, I expect the extent of improvement in governance structures to be increasing in the level of incentives faced by the firm. The level of incentives is, in turn, dependent on the characteristics of the MW detected.

One factor that can affect a firm's incentives to improve its governance structures is the severity and pervasiveness of the MW disclosed. More severe and pervasive detected weaknesses can reveal a greater extent of monitoring failures and, hence, a greater degree of inefficiency on the audit committee members and outside directors. When weaknesses are more severe and pervasive, the firm is likely to enjoy greater increases in net returns to managerial oversight through the improvement in the board

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limitation section of this study. However, this ceiling effect is mitigated for the following reasons. The descriptive statistics in Table 3 show that there is still room for improvement in the governance structures of the control firms. Further, the control firms should also have adequate incentives to improve their governance structures in the wake of recent accounting scandals and the passage of SOX. One argument that strengthens the results in Hypothesis 4 is that if the MW firms started out as having weak governance structures, they should also have a greater tendency to remain weak in general and snub the improvement of governance structure. This self-selection in the choice of MW firms thus works against finding positive results for Hypothesis 4.

and audit committee effectiveness. Further, because these weaknesses expose the firm to a greater likelihood of frauds and legal risks, the firm has incentives to improve its governance structure to reduce the likelihood of frauds and legal liability. Last, because more severe and pervasive weaknesses trigger a greater decline in the stock price (Hammersley et al. 2006, Emanuels et al. 2006), the firm is likely to improve its governance structure in order to recover its stock performance or at least, to prevent further decline in its stock price.

Consider the case of Health Net Inc. in which the MW detected relate to the incorrect recording of specific account balances. The MW is not considered to be severe or pervasive (because it only affects one category of weaknesses, i.e. the failure in the application of accounting rules). Because the MW can be easily corrected by management or "audited around" by the external auditor, the firm has less incentive to improve its governance structure. In contrast, in the case of Black Box Corporation, the MW relate to company-level controls such as the overall internal control environment, the monitoring process, internal audit function, etc. These MW are more severe and more pervasive (because they affect more categories of weakness). Because the MW suggest a greater degree of inefficiency by the audit committee members and outside directors in internal control monitoring, the firm is more likely to enjoy a greater increase in net returns to managerial oversight by improving its governance structure.

The persistence of MW can also have an effect on a firm's incentives to improve governance structure. On one hand, the board and audit committee may be able to

demonstrate that they have discharged their fiduciary duties by ensuring that internal control weaknesses are promptly remediated. Because the directors have proven to be effective monitors, replacing these directors will not necessarily increase the value of new board members' service or improve the governance structure. On the other hand, the failure to promptly remediate such weaknesses accentuates the directors' inability or unwillingness in discharging their fiduciary duties. Given this, the firm will enjoy a greater increase in the value of new board members' service when they appoint more effective directors to the board, and the benefits are likely to outweigh the costs.

Further, internal control weaknesses may persist either because the weaknesses simply take more time to remediate (e.g. information technology investment, implementing company wide policies and procedures, hiring of qualified finance personnel, etc.) or the firm may face financial constraints to do so. The persistence of internal control weaknesses can increase the firm's exposure to legal liability from its shareholders. As such, the firm may seek to improve the effectiveness of its governance structures in the short-run (e.g. by removing an insider from the board, by holding more meetings, by appointing more existing directors to the audit committee, etc.) so as to reduce its legal liability. The above discussions lead to the following hypothesis:

Hypothesis 4a: For firms with MW, improvement in corporate governance structures, i.e., effectiveness of the audit committees and boards of directors, is increasing in the severity, pervasiveness, and persistence of the MW.

3.4 Market Response to Improvement in Governance Structures

Because improving the corporate governance structure is costly, an important question is whether such improvements provide tangible benefits to the firms. Following the revelation of various accounting improprieties at several high profile companies, regulators have been concerned with the integrity of financial reporting systems and investor confidence in the capital market. Hence, I examine whether the improvement in governance structures help restore the capital market's confidence toward financial reporting and whether these improvements are being perceived positively by market participants.

As mentioned in Chapter 2, evidence that internal control weaknesses are perceived negatively by the market is shown in several extant studies (Hammersley et al. 2006, Ashbaugh et al. 2006b, Emanuels et al. 2006, Beneish et al. 2006). These studies generally find that firms with internal control weaknesses experience significant negative abnormal returns within the three-day window of the date of disclosure. Several explanations have been offered for the negative stock market reaction to the disclosures of internal control weaknesses.

Hammersley et al. (2006) point out that such negative market reaction is indicative of investors' reassessing the quality of management's oversight over the financial reporting process, leading to revisions in expectations about the firm's future profitability or to revisions in perceptions of firm risk. Emanuels et al. (2006) also contend that the

disclosure of internal control problems will decrease the value of the firm's stock because of the increased risk of bad performance.

Beneish et al. (2006) argue that investors may not have recognized that firms disclosing MW have poor earnings quality because investors often overlook value-relevant information in financial statements. Hence, MW disclosures under SOX 302 provide value-relevant information which reflects the lower credibility of firms' financial reports. Because investors require compensation for uncertainty about a firm's financial reporting, the disclosure of a MW under SOX has an adverse impact on the firm's stock price and cost of capital. Consistent with this argument, Ashbaugh et al. (2006b) posit that poor internal controls that result in less reliable financial reporting also increase the information risk faced by investors that manifests in a higher cost of capital.

The above evidence suggests that the capital market punishes firms with weak internal controls either through discounting stock price when weaknesses are disclosed or through a higher cost of capital. However, if the market perceives the improvement in governance structures as credible signals that the financial reporting quality is enhanced, then they ought to reward the firm by assigning a higher firm value and lower cost of equity (Farber 2005). Farber (2005) contends that there are difficulties (e.g. missing forecasts) involved in directly estimating changes in cost of equity capital associated with governance improvements. In his study, he takes an indirect approach and measures changes in cost of equity capital using buy-and-hold abnormal returns. Such an approach

is justified because increases in returns would be consistent with a decline in the cost of equity capital, and returns directly affect the cost of equity capital.

Using buy-and-hold abnormal returns also allows the examination of the long-term effect of internal control weakness disclosure. Emanuel et al. (2006) find that the initial negative abnormal returns due to internal control weaknesses have a much weaker effect subsequent to the disclosure. Hence, the capital market only penalizes the firms before or around the time of initial disclosures but not subsequently. If weak internal controls incentivize firms to improve their governance structures, and these improvements reduce investors' uncertainty over firms' financial reporting, then the changes will be gradually impounded in stock prices subsequent to the MW detection. This positive market reaction can be measured more effectively using a long window period, e.g. one-year or two-year period following the initial disclosure.

Only three studies have provided direct evidence on the market's reaction to changes in corporate governance structures. Rosenstein and Wyatt (1990) find a small positive mean abnormal return over a two-day window centered on the announcement dates of outside director appointments. DeFond et al. (2005) find a positive market reaction to the appointment of accounting financial experts to the audit committees, but no market reaction to the appointment of nonaccounting financial experts to the audit committee. Last, Farber (2005), using a sample of firms identified by the SEC as fraudulently manipulating their financial statements, finds a positive and economically significant relation between improvement in board independence and long-run buy-and-

hold abnormal returns over the three-year period following the fraud detection. To the extent that improvements in governance structures for firms with MW are perceived positively by the market, I expect such improvements to be associated with positive long-run abnormal returns for these firms.

Hypothesis 5: For firms with MW, improvement in corporate governance structures, i.e., effectiveness of the audit committees and boards of directors, results in a positive long-run buy-and-hold abnormal returns.

As explained above, investors are likely to perceive the improvement in the audit committee and the board as credible signals that the financial reporting quality is enhanced, and react positively to such improvements. Given this, the extent of the market reaction to the improvement in governance structure should depend on the extent to which investors perceive the financial reporting quality to be undermined. That is, the greater the extent to which the financial reporting quality is undermined, the more benefits the investors perceive to accrue from the improvement in governance structures.

The extent to which investors perceive the financial reporting quality to be undermined depends on the severity and pervasiveness of the MW disclosed. Hammersley et al. (2006) find that the market's reaction to characteristics of internal control weaknesses is contingent on the severity of the weaknesses. Emanuels et al. (2006) find that less severe internal control weaknesses, such as staffing issues, have no significant effect on stock returns, while problems related to financial reporting

complexity lead to significant negative abnormal returns. These results suggest that less severe and pervasive MW are less likely to cause investors to reevaluate their assessment of the firm's financial reporting quality. This, in turn, may attenuate the investors' reactions to the improvement in governance structures.

For instance, take the case of Health Net Inc. in which the MW are considered neither severe nor pervasive because the weakness relates to the incorrect recording of two specific account balances. In this case, investors may not perceive the firm's financial reporting quality to be severely undermined, and may perceive little benefits accruing from the improvement in governance structures. In the case of Black Box Corporation, the MW are considered to be both severe and pervasive, and pose greater risks to the firm's financial reporting (see also Ashbaugh et al 2006a, Doyle et al. 2007b). Because the MW cannot be corrected easily or "audited around" by the external auditors, the investors are likely to take additional comforts in the improvement of governance structures as enhancing the credibility of the firm's financial reporting. Given the above discussions, I expect the severity and pervasiveness of the MW detected to accentuate the long-run market's reaction to the improvement in governance structure.

On the other hand, I expect the persistence in MW (i.e. control weaknesses that are not remediated) to attenuate the positive effects of the improvements in governance structures. Ashbaugh et al. (2006a) find that firms that remediate internal control weaknesses exhibit an improvement in accruals quality, while firms that fail to do so continue to exhibit poorer accrual quality. Ashbaugh et al. (2006b) also find that firms

which disclose, but subsequently remediate internal control weaknesses, exhibit a decrease in cost of capital, whereas firms that fail to remediate internal control weaknesses exhibit no significant change in cost of capital. These results suggest that when internal control weaknesses persist, investors continue to perceive the financial reporting process to be unreliable and assign a higher information risk to the firm.

The uncertainty over the firm's financial reporting process is likely to dampen investors' perception of any positive benefits that could result from the improvements in governance structures. Investors may even perceive such improvement in governance structures as cosmetic and feel skeptical that the new directors that the firm brings in are actually capable of maintaining effective internal controls over financial reporting. This inability to promptly restore effective internal controls can cause investors to lose more confidence in the firm's financial reporting and corporate governance mechanisms. Given this, I expect that investors will react less positively to the improvements in governance structures when the MW persist than when they do not.

Hypothesis 5a: For firms with MW, the positive effect of improvement in corporate governance structures, i.e., effectiveness of the audit committees and boards of directors, on long-run buy-and-hold abnormal returns is (1) greater when the MW are more severe and pervasive, and (2) smaller when the MW are more persistent.

CHAPTER 4

RESEARCH DESIGN

4.1 Determinants of the Effectiveness of Corporate Governance Structures

4.1.1 Effectiveness of the Audit Committee

The main objectives of this study are to examine whether weak internal controls are associated with weak corporate governance structures, and whether firms with MW take steps to improve their governance structures upon revelation of MW. Hence, it is important to first establish what determines the effectiveness of both the audit committee and board of directors based on a review of existing literature.

Prior research suggests that audit committee effectiveness is affected by its composition and activity. Perhaps the most important attribute is the independence of the audit committee. Research studies have shown that more independent audit committees are more effective monitors. For instance, Dechow et al. (1996) find that firms with independent audit committees are less likely to be sanctioned by the SEC.

Klein (2002b) also finds a negative relation between the proportion of independent audit committee members and abnormal accruals, which is a proxy for earnings quality. Further, studies provide evidence that fully independent audit committees are negatively related to financial reporting misstatements or fraud (Abbott et al. 2000, Abbott et al. 2002). Regulators also hold the view that independent audit committees are more effective monitors as SOX has now mandated that audit committees

be comprised fully of independent directors.[9] I measure audit committee independence using ACINDP, which is an indicator variable coded 1 if the audit committee comprises of fully independent directors, and 0 otherwise.

Another important attribute of audit committee effectiveness is the level of financial expertise of the audit committee members. Higher financial expertise of the audit committee is found to be associated with fewer financial reporting problems (McMullen and Raghunadan 1996) and financial misstatements (Abbott et al. 2002). DeFond et al. (2005) also find a positive market reaction to the appointing of accounting financial experts to audit committees, consistent with accounting based financial skills improving the audit committee's perceived ability to ensure high-quality financial reporting. Given that internal control issues are complex in nature and may require a certain level of financial expertise to comprehend, I expect that financial expertise of the committee members is likely to influence the effectiveness of the audit committee in the monitoring of internal controls.

SOX requires that firms disclose whether they have a financial expert on the audit committee.[10] One controversy over the financial expertise requirement of SOX is the

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[9] Under SOX, an "independent" director is one not receiving, other than for service on the board, any consulting, advisory, or other compensatory fee from the issuer, and as not being an affiliated person of the issuer, or any subsidiary thereof. Even before SOX was passed, in 1999, all of the major U.S. stock exchanges began requiring their registrants to have 100 percent independent audit committee members, but gave the board the discretion to appoint inside directors when appropriate, and also exempted small issuers. However, with the passing of SOX, which requires the delisting of any firm that does not comply with the provisions in SOX, the SEC eliminated the exemptions contained in the pre-SOX listing standards.

definition of financial expertise. The initial SOX promulgations recommended a fairly narrow definition of financial expertise that focuses on whether the director has prior accounting-related experience with SEC financial reporting and suggests that such directors will have work experience as a public accountant, auditor, principal financial or accounting officer, or controller ("accounting financial expertise"). However, critics argue that this narrow definition is unnecessarily restrictive and drastically limits the pool of qualified directors. The final version of the SOX provision effectively expands the definition of financial expertise by also including the expertise gained through experience supervising employees with financial reporting responsibilities, overseeing the performance of companies and other experience ("nonaccounting financial expertise"). This wider definition hence captures directors who have prior experience as company presidents and CEOs. Given this controversy over the definition of financial expertise, I examine the effectiveness of the audit committee using both definitions of financial expertise. ACCEXP is the proportion of audit committee members with accounting financial expertise and NONACCEXP is the proportion of audit committee members with nonaccounting financial expertise.

To achieve effectiveness, the audit committee needs to include an adequate number of committee members to generate substantial discussion and to consider

[10]Although firms are not required to have a financial expert on the audit committee, this disclosure requirement can place pressure on firms to retain at least one financial expert on the audit committee. SOX also appears to have made the rules of the major U.S. stock exchanges redundant, because these exchanges have already required that audit committees be composed of at least one director who must have accounting or related financial management expertise. However, federal criminal statues seem to be more effective deterrents to non-compliance than exchange rules, and implementing new rules (even redundant rules) gives the appearance that legislators are taking actions (DeFond and Francis 2005).

emerging issues, as well as have access to management, external auditors, internal auditors, the full board and legal counsel (DeZoort et al. 2002). Empirical evidence suggests that larger audit committees are associated with higher financial reporting quality (Felo et al. 2003) and lower bond yield spreads (Anderson et al. 2004). Hence, I capture audit committee size using ACSIZE, which is the number of directors on the audit committee.

Research studies also find that the activity of the audit committee members have an effect on monitoring. For instance, greater activity of the audit committee is associated with less fraud (Beasley et al. 2000) and the employment of an industry specialist auditor (Abbott and Parker 2000). I measure the audit committee's diligence using ACMEET, which is the number of times the audit committee meets in a fiscal year.

4.1.2 Effectiveness of the Board of Directors

The effectiveness of the board is mainly affected by its composition and the diligence of the board members. Empirical studies examining board independence have generally concluded that more independent boards are more effective monitors because independent board members are more likely to act in the interest of shareholders and are less susceptible to undue influence by management (Weisbach 1988). More independent boards have been found to be associated with a lower likelihood of accounting fraud (Beasley 1996), lower likelihood of enforcement actions by the SEC (Dechow et al. 1996), and lower earnings management (Klein 2002b). I measure board independence using BDINDP, which is the proportion of board members who are independent.

Jensen (1993) argues a smaller board is a more effective monitor because a smaller board of directors plays a controlling function whereas a larger board is easier for the CEO to control. Further, he contends that large boards function less effectively due to coordination and processing problems. The studies by Yermack (1996) and Eisenberg et al. (1998) support this contention when they find that larger boards reduce firm value. Beasley (1996) also finds that smaller boards are important in deterring accounting fraud. These results suggest that small boards are likely to be more efficient in monitoring management. I measure board size using BDSIZE, which is the number of directors on the board.

Vafeas (1999) contends that a more diligent board acts as a more effective monitor because it increases the likelihood of the board taking actions beneficial to the shareholders, such as improving corporate performance or corporate governance. The study finds that operating performance improves following years of abnormal board activity. Klein (1998) also reports that meeting frequency is related to ownership structure and firm valuation. Hence, I capture board activity using BDMEET, the number of times the board meets in a fiscal year.

Last, separating the CEO and Chairman of the board positions may also strengthen board effectiveness (Jensen 1993). The CEO's power to control the board is often attributed to the belief that the CEO has by far the strongest voice in determining who is on the board of directors. The ability of outside board members to effectively

monitor management may be impacted by management's ability to limit board activities via controlling the board's chairperson position. One way stockholders limit the CEO's ability to hinder outside director monitoring is to segregate the key positions of CEO and board chairperson. I measure the duality of the CEO and Chairman position using the indicator variable DUALITY, coded 1 if the two positions are held by different individuals, and 0 otherwise.

I collect the corporate governance variables using information from the proxy statements (DEF 14A) filed by the firms that disclose MW in internal controls. I scrutinize information pertaining to each director on the board or audit committee as given in the proxy statements. This information includes the employment history of the directors, family relationships, and other material relationships. Following Krishnan (2005), I define an inside director or affiliated director as "current or former officers or employees of the company or of a related entity, relatives of management, professional advisors to the company, (e.g., consultants, bank officers, legal counsels), officers of significant suppliers or customers of the company,[11] and interlocking directors.[12]

I also determine if each audit committee member has accounting financial expertise or nonaccounting financial expertise. Accounting financial experts are directors with experience as a public accountant, auditor, principal or chief financial officer,

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[11] This information can be obtained from the section 'Related Party Transactions' in the proxy statements.
[12] The literature generally views "independence" as independence from management's influence (see also Carcello and Neal 2000). Under this definition, a director can still own stock in the company and be considered independent.

controller, or principal or chief accounting officer. Nonaccounting financial experts are directors with experience as the CEO or president of a for-profit corporation.[13] This information is obtained by examining the employment history of each director as disclosed in the proxy statements. Information on audit committee size, audit committee meetings, board size, board meetings, and CEO/Chairman duality are also obtained from the proxy statements.

4.2 Sample Selection and Composition

The internal control weaknesses disclosed under SOX provide the basis to identify firms with weak internal controls, and hence, the determinants of firms' internal control quality. I choose firms that disclosed weaknesses under SOX 302 instead of SOX 404 because these weaknesses are disclosed earlier and any corporate governance characteristics or changes observed are more likely attributable to SOX 302 instead of SOX 404. Choosing firms that disclosed weaknesses under SOX 404 may confound the results of the various tests performed because firms that have discovered weaknesses before SOX 404 may have already taken steps to improve their governance structures.

I identify the sample firms from *Compliance Week*, *AuditAnalytics*,[14] and the sample firms used in Doyle et al. (2007a).[15] I focus on firms which disclosed MW

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[13] The former categories are chosen based on the suggestions included in the initial version of SOX proposed by the SEC. The latter categories are inferred from the final version of SOX drafted by the SEC.
[14] *Compliance Week* (http://www.complianceweek.com) is an internet newsletter on corporate governance, risk and compliance that publishes monthly reports on firms reporting internal control weaknesses since November 2003. AuditAnalytics (http://www.auditanalytics.com) is an online market intelligence service

because the reporting of MW is mandatory while the reporting of significant deficiencies and control deficiencies is not.[16] Hence, using firms that disclosed significant deficiencies and control deficiencies may create self-selection problems because firms that voluntarily disclosed the deficiencies are more likely those that have stronger governance structures or have greater tendency to improve their governance structures. Further, MW represent a more severe form of internal control weakness and have the greatest likelihood of resulting in financial misstatements if not discovered. Hence, examining the governance characteristics and changes in governance structures of firms with these weaknesses are more important.

I choose firms that are accelerated filers and hence subject to SOX 404 reporting because these firms have greater market capitalization and, thus, greater economic impact and public interest when MW exist. These firms also face greater pressure to change their governance structures due to the issuance of independent auditor's report on internal controls. Based on the above discussion, I identify firms which disclosed at least one MW under SOX 302 from the period August 2003 to December 2004, and which are

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from Ives Group Inc, which keeps track of all firms disclosing internal control problems after SOX came into effect.

[15] I thank Jeffrey Doyle, Weili Ge, and Sarah McVay for sharing the data. The data can be found on http://pages.stern.nyu.edu/~smcvay/research/ICData.html.

[16] Auditing Standards No. 2 (PCAOB 2004) identifies three levels of internal control weakness based on the likelihood that a material misstatement of annual or interim financial statements might result. A control deficiency exists when the design or operation of a control does not allow, in the normal course of performing their assigned functions, management or employees to prevent or detect misstatements on a timely basis. A significant deficiency adversely affects the company's ability to record or report external financial data reliably in accordance with GAAP, such that there is more than a remote likelihood that a misstatement of a firm's financial statements that is more than inconsequential will not be prevented or detected. Material weaknesses result in more than a remote likelihood that a material misstatement of the financial statements will not be prevented or detected.

accelerated filers. The sample period is chosen to ensure a large enough sample to perform the various tests and to permit a sufficiently long period after the disclosure of the initial control weaknesses to track the firm's subsequent changes in corporate governance. Further, SOX 404 comes into effect in November 2004, and the first disclosures of MW took place as early as January 2005. Hence, the cut-off date of December 2004 ensures that all the MW disclosures pertain to SOX 302 weaknesses and not SOX 404 weaknesses.

Panel A of Table 1 summarizes the sample collection procedure. Using *Compliance Week, AuditAnalytics,* and the sample firms used in Doyle et al. (2007a), I identified an initial sample of 502 firms that reported at least one MW from August 2003 to December 2004. I exclude 152 firms that are not accelerated filers, 72 firms that subsequently terminated their securities registration, 26 firms that delayed the filings of their 10-Ks and internal control reports, 21 firms without proxy statements to obtain the corporate governance data, 13 firms with MW that are dated too far back (i.e. fiscal years 2001 and 2002), 12 firms that are foreign issuers, nine firms without the second SOX 404 reports, and eight firms that are subsidiaries of other firms within the sample. The sample selection procedure yields a sample of 189 firms that reported at least one MW from August 2003 to December 2004.

Table 1: Sample collection procedure and composition

Panel A: Sample collection procedure

Total material weaknesses (August 2003 to December 2004)	502
Less: Non-accelerated filers	(152)
Less: Securities registration termination	(72)
Less: No filings or delays in filings of 10-Ks since SOX 404 reporting	(26)
Less: No proxy statements available to obtain governance data	(21)
Less: Weaknesses dated too far back	(13)
Less: Foreign issuers	(12)
Less: No second SOX 404 reports	(9)
Less: Subsidiary of another material weakness firm	(8)
Less: No matching control firms	(5)
Final sample (August 2003 to December 2004)	184

Panel B: Composition of sample, by industry

Industry SIC Code	Industry Description	Number of Firms
10-17	Mining and Construction	15
20-39	Manufacturing	67
40-49	Transportation and Utilities	24
50-59	Wholesale and Retail	15
60-69	Financial Services	18
70-89	Services	45
Total		184

Panel C: Composition of sample, by exchange listing

Exchange	Number of Firms
NYSE	69
NASDAQ	103
AMEX	10
OTCBB	2
Total	184

After identifying the MW firms, I use a matched-pairs design to identify control firms.[17] Because the control firms are selected so that they do not have weak internal controls (as opposed to the sample firms that have weak internal controls), I make sure that these firms do not report any forms of internal control problems (i.e. control deficiencies, significant deficiencies, or MW) under SOX 302 or SOX 404, during the period November 2002 to December 2006. I use *AuditAnalytics* to ensure that these firms do not have any internal control problems, and I also examine the firms' 10-K, 10-Q, and 8-K filings during this period to make sure that no internal control problem of any nature is mentioned.

I then select control firms using the following matching criteria as in similar studies examining fraud and internal control quality (Farber 2005, Krishnan 2005). For each sample firm, I select a control firm from the same four-digit industry SIC code, and with net sales within + or – 25 percent of the firm's net sales for the 2003 fiscal year (Farber 2005). I also choose a control firm within the same stock exchange because exchange listings have an impact on firms' governance structures. If I cannot find a match within the same four-digit SIC code, I relax the above criteria to include firms with the same three-digit code, or two-digit code, or one-digit code. I also choose control

[17] I use a matched-sample design as opposed to a random sample because prior studies have shown that fraud or internal control weaknesses firms tend to be concentrated in certain industries (Farber 2005, Krishnan 2005). Hence, a matched sample based on industries classification would ensure that the sample firms and control firms have the same distribution of industries. Further, the use of a matched-sample design ensures that the sample firms and control firms are similar in terms of important characteristics, which makes univariate comparisons more meaningful. The use of matched-pair sample design is also evident in recent studies such as Farber (2005), Krishnan (2005), and Desai et al. (2006).

firms that are accelerated filers as are the sample firms, because accelerated and non-accelerated filers may face different incentives to improve their governance structures.

Based on the above matching procedure, five firms were further excluded because I was unable to find control firms even at the one-digit SIC code. The final usable sample consists of 184 firms that are matched to the MW firms based on the same stock exchanges, within 25 percent of the MW firms' net sales, and at least at the one-digit SIC code. The matching on exchange listing is perfect. One hundred two firms were matched based on four-digit SIC code, 15 firms were matched on three-digit SIC code, and 36 firms were matched based on two-digit SIC code. The remaining 31 firms were matched based on one-digit SIC code. Hence, the matching based on industries is not perfect.[18] The mean net sales of the MW firms and control firms (untabulated) are $1.84 billion and $1.62 billion, respectively, and this difference is not statistically significant (p = 0.67). This shows that the matching of net sales is also successful. The market value of equity of the MW firms and control firms (untabulated) are $1.58 billion and $1.95 billion, respectively, and this difference is also not statistically significant (p = 0.53).

Panel B of Table 1 shows the composition of the MW firms and control firms based on the two-digit industry SIC codes. The panel shows a relatively high concentration of MW firms in the manufacturing and services industries. This result is

[18] The matching based on one-digit is unavoidable in the matching process. Because matching based on one-digit SIC code may not be a good match, this is considered as a limitation of this study and is discussed under Section 6.3 of this study. I also replicate the results after excluding these 31 firms, and the results are the same as those presented in this study.

consistent with Krishnan (2005) and Farber (2005) which find a relatively high number of firms with internal control problems and frauds, respectively, in these industries. Panel C of Table 1 shows the composition of the MW firms based on their exchange listing. The panel shows that the sample firms are mostly listed on the larger stock exchanges, i.e., NYSE and NASDAQ. The likely reason for this result is the accelerated-filer status of the sample and control firms.

4.3 Testing the Relation between Audit Committee and Board Effectiveness and the Incidence of MW (Hypothesis 1)

I use the following conditional logit regression model to test whether the effectiveness of the audit committee and the board, is negatively associated with the incidence of MW. The conditional logistic regression is useful in investigating the relation between an outcome (whether the firm is a sample firm with MW or a control firm without such weaknesses) and a set of explanatory variables in a matched-pairs design (see Hosmer and Lemeshow 2000).[19] The model can take into account the non-random nature of the data and yield maximum likelihood estimators of the explanatory variables in the logistic regression model which are consistent and asymptotically normally distributed. Examples of other studies that use this type of regression model to analyze matched-pairs data include Zhang et al. (2006) and Carcello et al. (2006).

[19] According to Hosmer and Lemeshow (2000), in a matched-pairs design, the matching criteria create many strata and few observations per stratum. As such, this increases the coefficients for the stratum-specific design variables. If we regard the stratum specific parameters as nuisance parameters and are willing to forgo their estimation, then we can create a conditional likelihood which will yield maximum likelihood estimators of the slope coefficients in the logistic regression model which are consistent and asymptotically normally distributed. This explains why there is no intercept term in the conditional logit model. I use the proc mdc command in SAS program to run the conditional logit model.

$$\Pr(MWF=1) = a + b_1ACINDP + b_2ACCEXP + b_3NONACCEXP + b_4ACSIZE + b_5ACMEET + b_6BDINDP + b_7BDSIZE + b_8BDMEET + b_9DUALITY + b_{10}BLOCKOWN + b_{11}INSIDEOWN + b_{12}INSTOWN + b_{13}LGTA + b_{14}ZFC + b_{15}SEGMENTS + b_{16}FOREIGN + b_{17}GROWTH + b_{18}MARESTR + b_{19}LITIGATION + \varepsilon$$

The dependent variable, MWF, is coded 1 for firms with MW, and 0 for the control firms. To reduce the possibility that firms may change their governance structures at the time of detection of MW, I measure the corporate governance variables based on the year prior to the MW detection. The control variables are also measured based on the year prior to the MW detection, except for FOREIGN and MARESTR, which are coded 1 based on whether the firms reported foreign currency translation adjustment, mergers, acquisitions, or restructuring either in the fiscal year prior to the MW detection or in the fiscal year of the MW detection. Hypothesis 1 predicts the coefficients b_1, b_2, b_3, b_4, b_5, b_6, b_8 and b_9 to be negative and significant, and the coefficient b_7 to be positive and significant. APPENDIX B summarizes the definition of the variables in the regression model, as well as the expected signs of the independent variables.

I control for other monitoring mechanisms that may affect the quality of the firm's internal controls. Shleifer and Vishny (1986) and Jensen (1993) note that large blockholders have incentives to monitor management and serve as an additional control

mechanism. The presence of this control mechanism may reduce the need for monitoring by a board or audit committee. I consider a major shareholder as a blockholder if the individual holds at least five percent stake in the firm's stock (Desai et al. 2006). Following Farber (2005), I measure the extent of blockholders' monitoring by the percentage of stock held by blockholders (BLOCKOWN). A larger proportion of insider holdings can improve corporate governance because it better aligns the insiders' interests with shareholders' interests. Hence, I expect that firms with greater ownership held by management and directors are less likely to have MW. I use INSIDEOWN to represent the total percentage of stock held by management and directors (Farber 2005).

Institutional shareholders can also improve corporate governance through better external monitoring (Shleifer and Vishny 1986). Hence, I expect that higher institutional ownership reduces the likelihood of MW. Institutional ownership is measured by INSTOWN, which is the percent of stock held by all institutional owners of the firm. I hand-collect information on blockholders and percentage of stock held by management and directors from the proxy statements. Data on institutional holdings are obtained from the CDA Investment Technologies Spectrum database, which is derived from the SEC Form 13-F disclosure forms reported quarterly to the SEC.

As shown in Chapter 2, firms with internal control deficiencies exhibit certain financial characteristics that need to be controlled when examining the relation between the incidence of MW and corporate governance structures. Smaller firms and firms in financial distress have less adequate resources and are more prone to internal control

weaknesses. Hence, I control for firm size using LGTA, which is the log of total assets of the firm[20]. I capture distress risk using the Zmijewski's (1984) measure of financial distress (ZFC). The measure is calculated from the probit coefficients of Zmijewski (1984), with greater values of ZFC indicating higher levels of distress present in the firm.

Firms that operate in diversified operating segments, or in both domestic and foreign markets are likely to have larger operations and more complex transactions, increasing the likelihood that internal controls fail to meet the demands of complex business operations. Consistent with Ashbaugh et al. (2007), I use the number of business segments, SEGMENTS, as reported in the Compustat Segment File to control for the complexity of the firm. I also use FOREIGN to proxy for the scope of the firm's operations. The indicator variable is coded 1 if the firm reports a non-zero foreign currency translation, and 0 otherwise.

Firms that are undergoing restructuring may complicate firms' attempts to ensure effective internal controls. Fast growing firms also experience rapid growth in sales revenues and operations that may outpace the rate in which the firms invest in internal controls for financial reporting. As such, these firms are exposed to increasing control risks. The indicator variable, MARESTR, is coded 1 if the firm reports any restructuring

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[20] The research design section shows that although the matching based on sales is successful (the mean net sales of the MW firms and control firms are $1.84 billion and $1.62 billion, respectively, and this difference is not significant with $p = 0.67$), the matching is still not perfect and the MW firms have larger sales than the control firms. Because both total assets and sales are proxies for firm size, the addition of the variable, log of total assets, can also serve to further control for any differences in size between the MW and control firms. The results are the same when LGTA is excluded from the regression.

charges, or the AFTNT1 file in Compustat indicates that the presence of a merger and acquisition, and 0 otherwise. I measure sales growth using GROWTH, which is the percentage change in the net sales from the year prior to the MW detection to the year of the MW detection. A higher percentage increase in sales hence reflects a higher level of sales growth[21].

Last, deficient internal controls over financial reporting may result in financial restatements and decline in stock price, further triggering lawsuits by shareholders if the firm fails to ensure effective internal controls. This litigation risk is especially high for firms that operate in more litigious industries, such as the biotechnology, computers, electronics, and retailing industries (Francis et al. 1994), and provides further incentives for firms to ensure effective internal controls. To capture firms with higher litigation risk, I use the indicator variable LITIGATION, which is coded 1 if a firm operates in industries with SIC codes 2833-2836 (biotechnology), 3570-3577 and 7370-7374 (computers), 3600-3674 (electronics), and 5200-6961 (retailing), and 0 otherwise.

4.4 Testing the Relation between the Incidence of MW and the Turnover of Top Management, Audit Committee Members and Outside Directors (Hypotheses 2a, 2c, and 3a)

The following binary logistic regression models are used to test the relation between the incidence of MW and the likelihood of turnover of top management

[21] I also capture GROWTH using the three-year compound sales growth prior to the MW detection. The results are qualitatively similar.

(MGTTURNOVER), audit committee members (ACTURNOVER), and outside directors (BDTURNOVER). As before, MWF is coded 1 for MW firms, and 0 for control firms.

$$\Pr(\text{MGTTURNOVER}=1) = a + b_1\text{MWF} + b_2\text{STKPERF} + b_3\text{ZFC} + b_4\text{RESTATE} + b_5\text{LGTA} + b_6\text{MARESTR} + b_7\text{MGTAGE} + b_8\text{MGTTENURE} + b_9\text{DUALITY} + b_{10}\text{BLOCKOWN} + b_{11}\text{INSIDEOWN} + b_{12}\text{INSTOWN} + \varepsilon$$

$$\Pr(\text{ACTURNOVER1}=1), \Pr(\text{ACTURNOVER2}=1), \Pr(\text{ACTURNOVER3}=1) = a + b_1\text{MWF} + b_2\text{STKPERF} + b_3\text{ZFC} + b_4\text{RESTATE} + b_5\text{LGTA} + b_6\text{MARESTR} + b_7\text{ACAGE} + b_8\text{ACTENURE} + b_9\text{DUALITY} + b_{10}\text{BLOCKOWN} + b_{11}\text{INSIDEOWN} + b_{12}\text{INSTOWN} + \varepsilon$$

$$\Pr(\text{BDTURNOVER1}=1), \Pr(\text{BDTURNOVER2}=1), \Pr(\text{BDTURNOVER3}=1) = a + b_1\text{MWF} + b_2\text{STKPERF} + b_3\text{ZFC} + b_4\text{RESTATE} + b_5\text{LGTA} + b_6\text{MARESTR} + b_7\text{BDAGE} + b_8\text{BDTENURE} + b_9\text{DUALITY} + b_{10}\text{BLOCKOWN} + b_{11}\text{INSIDEOWN} + b_{12}\text{INSTOWN} + \varepsilon$$

MGTTURNOVER is an indicator variable that is coded 1 if any individual holding the title of CEO, Chairman, and/ or President in the year before the MW detection, leaves the firm within two years of the MW detection, and 0 otherwise. The indicator variable, ACTURNOVER1, is coded 1 if at least one audit committee member in the year before the MW detection leaves the firm within two years of the MW

detection, and 0 otherwise. The indicator variables, ACTURNOVER2 and ACTURNOVER3, are coded 1 if at least half of the audit committee members (≥ 50%) and more than half of the audit committee members (> 50%), respectively, in the year before the MW detection leave the firm within two years of the MW detection, and 0 otherwise. BDTURNOVER1, BDTURNOVER2, and BDTURNOVER3 are indicator variables defined similarly for all the outside directors on the board in the year before the MW detection. If the top management, audit committee members, and outside directors in the MW firms suffer penalties for internal control failures as predicted by Hypothesis 2a and 2c, then the coefficient b_1 is expected to be positive and significant in all the regression models.

I also control for size using LGTA, which is the natural log of the total assets of the firm. Consistent with Desai et al. (2006), I control for firm stock performance because turnover could also result from poor financial performance. STKPERF measures the raw buy-and-hold returns over the month -12 to +12 relative to the disclosure of MW. I also control for the level of financial distress using ZFC, because Gilson (1989) and Gilson (1990) find that firms in higher financial distress have higher turnover of top management and board of directors. Like before, ZFC is the financial distress measure, calculated from the probit coefficients of Zmijewski (1984), with greater values of ZFC indicating higher levels of distress present in the firm.

Desai et al. (2006) finds that earnings restatement firms have a higher turnover of top management. The univariate test results in Srinivasan (2005) also show that earnings

restatement firms have a higher turnover of audit committee members and outside directors. Hence, I control for the possibility that earnings restatements will affect the results in the regression models. RESTATE is an indicator variable that is coded 1 if a firm announces one or more earnings restatements from the year before the MW detection to the second year after the MW detection.[22] I also include MARESTR in the regression model because firms undergoing mergers, acquisitions, and/or restructuring are also more likely to experience management or board changes, and hence experience greater turnover of top management, audit committee members and outside directors.

As in Desai et al. (2006), I control for managerial and board entrenchment using two proxies. The first proxy is DUALITY, which is defined earlier. Prior research has used this variable as a control because CEOs who are also chairmen of the board have greater influence on the board and may affect turnover (Beasley 1996, Dechow et al. 1996). The second proxy is the level of insider ownership (INSIDEOWN). Firms with higher levels of blockholder ownership and institutional ownership are likely to be better monitored (Shleifer and Vishny 1996) and, in turn, remove ineffective managers or directors from the firm. Given this, I also include BLOCKOWN and INSTOWN in the regression models.

Last, I control for the age and tenure of top management, audit committee members, and outside directors. Individuals who are older are more likely to voluntarily

[22] I also replicate the results by focusing only on those restatements that are GAAP-mandated. The results are similar to those presented in this study.

leave the firm due to retirement or health reasons, and individuals who have longer tenures may be more entrenched within the firm and less likely to leave the firm. MGTAGE and MGTTENURE are the mean age and tenure, respectively, of the individuals holding the positions of CEO, Chairman, and President. ACAGE and ACTENURE (BDAGE and BDTENURE) are the mean age and tenure, respectively, of the audit committee members (outside directors).

Hypothesis 3a further predicts that firms with more severe (SEVERE), pervasive (PERVADE), and persistent (PERSIST) weaknesses experience greater turnover of top management, audit committee members, and outside directors. To test this hypothesis, I repeat the above analyses by replacing MWF in each of the above regression models with SEVERE, PERVADE, and PERSIST, and by conducting the analyses on the sample of MW firms.

SEVERE is an indicator variable that is coded 1 if the firm disclosed at least one severe MW in either its initial or subsequent disclosures. I use *AuditAnalytics* to determine the severity of the MW. The database classifies internal control weaknesses disclosed by a firm into broad categories of weaknesses. APPENDIX C details the categories which I classify as the more severe weaknesses, and the categories which I classify as the non-severe weaknesses. PERVADE is the total number of different categories of weaknesses in APPENDIX C that are disclosed by the sample firm in its initial and subsequent disclosures. More categories of weaknesses disclosed would indicate a greater extent of pervasiveness in the firm's MW. Last, PERSIST is an

indicator variable that is coded 1 if the firm fails to remediate the MW within two years of the initial disclosure. A firm is considered to have fully remediated the MW at the fiscal year end date of its first subsequent unqualified SOX 404 opinion.[23]

4.5 Testing the Relation between the Incidence of MW and the Loss of Outside Directorships (Hypotheses 2b and 3b)

The following OLS regression model is used to test the relation between the incidence of MW and the loss of outside directorships by audit committee members and outside directors.

$$\begin{aligned} \text{ACSEATLOSS} &= a + b_1\text{MWF} + b_2\text{STKPERF} + b_3\text{ZFC} + b_4\text{RESTATE} + b_5\text{LGTA} \\ &\quad + b_6\text{ACSEATBEF} + b_7\text{ACAGE} + b_8\text{ACTENURE} + \varepsilon \\ \text{BDSEATLOSS} &= a + b_1\text{MWF} + b_2\text{STKPERF} + b_3\text{ZFC} + b_4\text{RESTATE} + b_5\text{LGTA} \\ &\quad + b_6\text{BDSEATBEF} + b_7\text{BDAGE} + b_8\text{BDTENURE} + \varepsilon \end{aligned}$$

ACSEATLOSS is defined as the mean number of outside directorships in other public companies lost by the audit committee members from the year before the MW detection to the second year following the MW detection. BDSEATLOSS is defined as the mean number of outside directorships in other public companies lost by the outside directors from the year before the MW detection to the second year following the MW detection. I first refer to the proxy statements of the MW firms to find out the number of

[23] This is also consistent with Ashbaugh et al. (2006b) which considers full remediation of internal control weaknesses when an unqualified SOX 404 report is issued.

outside directorships in public companies held by each audit committee member or outside director in the year before the MW detection. For those directors who are still with the MW firms two years after the MW detection, I collect the same information from the proxy statements of these firms. For those directors who leave the MW firms, I use http://www.zoominfo.com[24] and *AuditAnalytics*[25] to identify any public companies that these directors sit on two years following the MW detection. Then, I refer to the proxy statements of any one of these public companies and obtain the outside directorships information of the director. Using this method, I am able to track the outside directorships of audit committee members and outside directors even if they have left the MW firms.

If the revelation of MW resulted in reputational penalties through the loss of outside directorships (Hypothesis 2b), then I expect the coefficient b_1 in the regression model to be positive and significant. Size is controlled for using the log of the total assets of the firm, LGTA. I also include STKPERF and ZFC to control for the possibility that the loss in outside directorships could be due to lackluster financial performance in the MW firms. I include RESTATE because audit committees and outside directors of restating companies face greater likelihood of loss of outside directorships (Srinivasan 2005). I also control for the fact that directors with more outside directorships are more

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[24] ZoomInfo, is a free internet summarization search engine that provides comprehensive information on over 31 million business professionals and 2 million companies across every industry. The website tracks information from millions of online sources such as Web sites, press releases, electronic news services and SEC filings and summarizes the information into a comprehensive format.

[25] I downloaded the director information of all SEC registrants from *AuditAnalytics* as at December 1, 2006. This allows me to know any directors sitting on the board of a public company as of this date.

likely to lose directorships. The variable, ACSEATBEF (BDSEATBEF), is the mean number of directorships in other public companies held by the audit committee members (outside directors) in the year before the MW detection. Last, I control for the mean age and tenure of the audit committee members (ACAGE, ACTENURE) and outside directors (BDAGE, BDTENURE).

Hypotheses 3b further predicts that the loss in outside directorships by the audit committee members and outside directors is increasing in the severity, pervasiveness, and persistence of the MW detected. To test this hypothesis, I repeat the above analyses by replacing MWF in each of the regression models with SEVERE, PERVADE, and PERSIST, and by conducting the analyses on the sample of MW firms. SEVERE, PERVADE, and PERSIST are defined as before.

4.6 Testing the Relation between the Incidence of MW and Improvement in Corporate Governance Structures (Hypotheses 4, 4a)

I first use univariate analyses to compare the changes in corporate governance characteristics from the year before the MW detection up to the second year following the MW detection for both the MW firms and the control firms. Hypothesis 1 predicts that, in the year before the MW detection, firms with weaker corporate governance structures are more likely to have MW. If, as predicted by Hypothesis 4, MW firms improve their governance structures relative to the control firms following the MW detection, then the corporate governance characteristics of the MW firms and the control firms are expected

to be insignificantly different in the second year following the MW detection (see also Farber 2005 for a similar research design).

To more rigorously test the hypothesis that the MW firms show greater improvement in governance structures than the control firms, I create a composite measure of the overall improvement in audit committee and board characteristics. A firm is assigned a score of 1 for each positive change in governance characteristic from the year before the MW detection to the second year following the MW detection, except for board size, in which case a score of 1 is assigned for a negative change. The individual scores are then summed up to obtain the composite score of overall improvement in governance structure, CHANGE. The range of scores for CHANGE is from 0 to 9, with higher values indicating a greater overall improvement in governance structure. I then use the following OLS regression model to test whether CHANGE is significantly greater for the MW firms. If the MW firms experience greater improvements in governance structures than the control firms as predicted by Hypothesis 4, then MWF would be positive and significant.

$$\begin{aligned} CHANGE = {} & a + b_1MWF + b_2STKPERF + b_3ZFC + b_4LGTA + b_5MARESTR \\ & + b_6RESTATE + b_7LITIGATION + b_8BLOCKOWN + \\ & b_9INSIDEOWN + b_{10}INSTOWN + \varepsilon \end{aligned}$$

Hypothesis 4a further predicts that the improvement in governance structure for the MW firms is increasing in the severity, pervasiveness, and persistence of the MW.

To rigorously test this hypothesis, I run the above model by replacing MWF with SEVERE, PERVADE, and PERSIST, and by conducting the analyses on the sample of MW firms. SEVERE, PERVADE, and PERSIST are defined as before. Hypothesis 4a predicts the coefficient of SEVERE, PERVADE, and PERSIST to be positive and significant.

4.7 Testing the Relation between Improvement in Governance Structures and Long-Run Buy-and-Hold Abnormal Returns (Hypothesis 5, 5a)

As mentioned earlier, if the market perceived the improvement in governance structures as credible signals that the financial reporting quality is enhanced, they should reward the firm by assigning a higher firm value. This higher firm value would be achieved through a higher stock price and lower cost of equity, which is reflected in positive long-run buy-and-hold abnormal returns. This approach is similar to that used in Farber (2005) in which examines the long-run market reaction to the firm's improvement in governance structure following fraud detection. The following regression is used to test the relation between the improvement in governance variables and long-run buy-and-hold abnormal returns, BHAR.

$$BHAR = a + b_1 \Delta CGVAR + b_2 \Delta ROA + b_3 BMV + b_4 MVE + \varepsilon$$

The two-year buy-and-hold return (BHR) is first computed by compounding the monthly returns from the year before the MW detection to the year after the MW detection (i.e. months -12 to +12 relative to the MW detection). This is the same as

STKPERF defined earlier. Then, the two-year buy-and-hold abnormal return, BHAR, is computed by taking the difference between BHR of the MW firms and that of the (1) CRSP equal-weighted index, (2) CRSP value-weighted index, (3) CRSP S&P 500 Index, and (4) control firms *of the same window period*. The variable, ΔCGVAR, represents the vector of governance variables that exhibit improvement from the year before the MW detection to the year after the MW detection. Hypothesis 5 predicts that the coefficients for ΔCGVAR to be positive and significant, except for BDSIZE, which is predicted to be negative and significant.

Consistent with Farber (2005), I control for financial performance using ΔROA, BMV, and MVE. The variable, ΔROA, is the change in return on assets from the year before the MW detection to the year after the MW detection. The variable, BMV, is the book value per share divided by the market value per share of the MW firm in the year before the MW detection. Market value of equity (MVE) is the log of the market value of equity of the MW firm in the year before the MW detection.

The results from the above analysis will shed light on those governance variables of which an improvement will be capitalized in the long-run buy-and-hold abnormal returns. Hypothesis 5a further predicts that the relation between the improvement in governance structures and the long-run buy-and-hold return is increasing in the severity and pervasiveness of the MW, and decreasing in the persistence of the MW. To test this hypothesis, I conduct additional regression analyses by interacting those governance variables that exhibit improvement with SEVERE, PERVADE, and PERSIST. The

regression model is shown below. Hypothesis 5a predicts the coefficients for b_5 and b_6 to be positive and significant, and b_7 to be negative and significant for all governance variables.

$$BHAR = a + b_1 \Delta CGVAR + b_2 SEVERE + b_3 PERVADE + b_4 PERSIST + b_5 \Delta CGVAR \times SEVERE + b_6 \Delta CGVAR \times PERVADE + b_7 \Delta CGVAR \times PERSIST + b_8 \Delta ROA + b_9 BMV + b_{10} MVE + \varepsilon$$

CHAPTER 5

EMPIRICAL RESULTS

5.1 The Relation between Audit Committee and Board Effectiveness and the Incidence of MW (Hypothesis 1)

Table 2 reports the descriptive statistics and univariate test results. The table shows that the MW firms and control firms differ in terms of the relative strength of their corporate governance structures. The control firms have a greater proportion of directors on the audit committees who are independent (ACINDP), a greater proportion of audit committee members with accounting financial expertise (ACCEXP), larger audit committees (ACSIZE), and a greater proportion of directors on the board who are independent (BDINDP) than the MW firms ($p < 0.05$, one tailed). The sample of MW firms has a greater proportion of firms with a split CEO/ Chairman leadership structure (DUALITY) than the sample of control firms ($p < 0.10$, one tailed). The MW firms and the control firms, however, do not differ significantly in terms of the audit committee meeting frequency (ACMEET), the proportion of audit committee members with nonaccounting financial expertise (NONACCEXP), the size of the entire board (BDSIZE), and the board meeting frequency (BDMEET). Among the other governance variables, the MW firms have a lower level of inside ownership (INSIDEOWN) and blockholder ownership (BLOCKOWN) than the control firms ($p < 0.10$, one-tailed).

Table 2: Descriptive statistics and univariate tests on the incidence of MW

		MW firms (n=184)		Control firms (n=184)			
Variable [a]	**Expected sign**	**Mean**	**Median**	**Mean**	**Median**	**t-statistics[b]**	**Wilcoxon Z[c]**
ACINDP	-	0.72	1.00	0.82	1.00	-2.23**	-2.21**
ACCEXP	-	0.14	0.00	0.20	0.20	-2.68***	-2.17**
NONACCEXP	-	0.66	0.66	0.70	0.66	-1.18	-1.10
ACSIZE	-	3.41	3.00	3.60	3.00	-2.16**	1.92**
ACMEET	-	6.36	6.00	6.00	5.00	1.22	0.94
BDINDP	-	0.62	0.62	0.69	0.69	-3.83***	-3.43***
BDSIZE	+	8.20	8.00	8.22	8.00	-0.07	-0.14
BDMEET	-	7.85	7.00	7.50	7.00	0.83	0.16
DUALITY	-	0.46	0.00	0.36	0.00	1.34*	0.99
BLOCKOWN	-	29.8	26.8	33.1	29.8	-1.56*	-1.08
INSIDEOWN	-	14.4	9.90	17.3	9.05	-1.62*	-0.98
INSTOWN	-	0.51	0.53	0.54	0.55	-1.12	-1.26
LGTA	-	6.34	6.17	6.29	6.16	0.34	0.32
ZFC	+	0.091	0.0029	0.049	0.00040	2.10**	3.67***
SEGMENTS	+	2.76	3.00	2.12	1.00	3.12***	3.39***
FOREIGN	+	0.38	0.00	0.21	0.00	3.48***	3.43***
MARESTR	+	0.68	1.00	0.58	1.00	2.17**	2.15**
GROWTH	+	0.17	0.082	0.24	0.12	-1.26	-2.15**
LITIGATION	-	0.42	0.00	0.48	0.00	-1.05	-1.05
n		184		184			

***, **, * Significant at less than 1 percent, 5 percent, and 10 percent levels, respectively, based on one-sided tests.

[a] See APPENDIX B for definitions of independent variables

[b] A two-sample t-test is used to test for significant differences in means between the MW firms and control firms.

[c] A Wilcoxon-Mann-Whitney two-sample test is used to test whether the observations in the MW firms and control firms are from populations with different distributions (i.e. whether the medians are different between the two groups).

Table 3: Pearson correlation coefficients among independent variables

Variables [a]	ACINDP	ACCEXP	NONACCEXP	ACSIZE	ACMEET	BDINDP	BDSIZE	BDMEET	DUALITY	BLOCKOWN
ACINDP	1.00	0.13**	0.12**	-0.019	0.055	0.43***	-0.011	-0.043	-0.12**	-0.047
ACCEXP		1.00	-0.12**	-0.085	0.062	0.082	-0.022	0.099	0.049	0.056
NONACCEXP			1.00	0.029	0.041	0.17***	-0.016	0.063	0.0070	-0.024
ACSIZE				1.00	0.043	0.28***	0.58***	0.14***	-0.067	-0.24***
ACMEET					1.00	0.085	0.10**	0.19***	0.032	-0.06
BDINDP						1.00	0.11**	0.041	-0.090*	-0.31***
BDSIZE							1.00	0.078	-0.0010	-0.15***
BDMEET								1.00	0.12**	-0.16***
DUALITY									1.00	-0.034
BLOCKOWN										1.00
INSIDEOWN										
INSTOWN										
LGTA										
ZFC										
SEGMENTS										
FOREIGN										
MARESTR										
GROWTH										
LITIGATION										

(continued on next page)

TABLE 3 (Continued)

	INSIDEOWN	INSTOWN	LGTA	ZFC	SEGMENTS	FOREIGN	MARESTR	GROWTH	LITIGATION
ACINDP	-0.051	0.20***	0.067	0.016	0.0061	0.0034	0.043	0.024	0.010
ACCEXP	-0.048	0.013	-0.050	0.046	-0.049	0.031	0.024	0.018	0.069
NONACCEXP	0.016	0.14***	0.0034	0.022	0.040	0.025	0.070	0.093	0.0076
ACSIZE	-0.24***	0.15***	0.50***	-0.11**	0.32***	0.071	0.024	-0.11	-0.12**
ACMEET	-0.099*	0.24***	0.19***	0.011	0.13**	0.12**	0.072	-0.10*	0.068
BDINDP	-0.30***	0.22***	0.22***	-0.11**	0.09*	0.061	0.15***	-0.011	-0.033
BDSIZE	-0.15***	0.14***	0.56***	-0.043	0.35***	0.084	0.015	-0.080	-0.15***
BDMEET	-0.14***	-0.037	0.16***	-0.0029	0.14***	0.14***	0.045	0.058	0.073
DUALITY	0.014	-0.18***	-0.21***	0.019	-0.027	-0.012	-0.053	-0.014	0.11**
BLOCKOWN	0.64***	-0.035	-0.27***	0.12**	-0.26***	-0.11**	-0.096*	0.12**	-0.012
INSIDEOWN	1.00	-0.27***	-0.33***	0.016	-0.22***	-0.16***	-0.19***	0.21***	0.053
INSTOWN		1.00	0.37***	-0.084	0.050	0.052	0.16***	-0.066	-0.057
LGTA			1.00	-0.046	-0.076	-0.018	-0.00088	-0.032	-0.084
ZFC				1.00	-0.076	-0.018	-0.00088	-0.032	-0.084
SEGMENTS					1.00	0.061	0.094*	-0.094*	-0.21***
FOREIGN						1.00	0.22***	-0.10*	-0.045
MARESTR							1.00	-0.021	-0.075
GROWTH								1.00	0.012
LITIGATION									1.00

***, **, * Significant at less than 1 percent, 5 percent, and 10 percent levels, respectively based on two-sided tests.

[a] See APPENDIX B for definitions of independent variables

The MW firms and control firms also exhibit differences in their financial variables. The MW firms are more likely to be in higher financial distress (ZFC), undergoing either mergers, acquisitions, or restructuring (MARESTR), have more operating segments (SEGMENTS), and have foreign operations (FOREIGN) than the control firms ($p < 0.05$, one-tailed). The MW firms and control firms do not differ significantly in size (LGTA), possibly due to the matching procedure as described above. There is also no evidence that the MW firms grow more rapidly in their net sales (GROWTH) or are less likely to operate in litigious industries (LITIGATION) than the control firms.

Table 3 presents the Pearson correlations. In general, the audit committee and board variables are highly correlated. This is not unexpected because the audit committee is a subset of the board, and board characteristics could simply reflect audit committee characteristics, or vice versa. The correlation coefficients among the independent variables range from -0.33 (between INSIDEOWN and LGTA) to 0.64 (between BLOCKOWN and INSIDEOWN). The variance inflation factors (VIFs) of all the independent variables are under 2.5, suggesting that multicollinearity is not a concern.

Table 4: Logistic regression results on the incidence of MW

$$\Pr(MWF=1) = a + b_1ACINDP + b_2ACCEXP + b_3NONACCEXP + b_4ACSIZE + b_5ACMEET + b_6BDINDP + b_7BDSIZE + b_8BDMEET + b_9DUALITY + b_{10}BLOCK + b_{11}INSIDEOWN + b_{12}INSTOWN + b_{13}LGTA + b_{14}ZFC + b_{15}SEGMENTS + b_{16}FOREIGN + b_{17}GROWTH + b_{18}MARESTR + b_{19}LITIGATION + \varepsilon$$

		Model 1[a]	
Variables [b]	**Expected sign**	**Coefficient Estimates**	**t-statistics**
ACINDP	-	-0.34	-0.91
ACCEXP	-	-1.84	-2.45***
NONACCEXP	-	-0.89	-1.54*
ACSIZE	-	-0.44	-2.24**
ACMEET	-	0.078	1.55*
BDINDP	-	-2.40	-2.22**
BDSIZE	+	-0.027	-0.33
BDMEET	-	-0.037	-0.92
DUALITY	-	0.19	1.02
BLOCKOWN	-	-0.0059	-0.60
INSIDEOWN	-	-0.017	-1.45*
INSTOWN	-	0.16	0.24
LGTA	-	0.070	0.29
ZFC	+	1.96	2.22**
SEGMENTS	+	0.32	3.06***
FOREIGN	+	0.92	2.59***
MARESTR	+	0.49	1.44*
GROWTH	+	-0.085	-0.29
LITIGATION	-	-2.26	-2.49***
Likelihood ratio		78.57***	
(p-value)		(<0.0001)	
Pseudo R-squared[b]		0.31	
n		368	

***, **, * Significant at 1 percent, 5 percent, and 10 percent levels respectively, based on one-tailed tests where signs are predicted, two-tailed tests otherwise.

[a] The conditional logit model does not yield an intercept term.

[b] See APPENDIX B for definitions of independent variables. The dependent variable is an indicator coded 1 for MW firms and 0 for control firms.

[c] The pseudo R-squared is based on the McFadden's Likelihood Ratio Index.

Table 4 presents the logistic regression results for the model examining whether the effectiveness of the audit committee and board is negatively associated with the incidence of MW.[26] The model is significant, as indicated by the Chi-squared of its likelihood ratio. The pseudo R-squared is 0.31, suggesting a high goodness-of-fit. As predicted, the proportion of audit committee members with accounting financial expertise (ACCEXP) is negative and significant ($p < 0.01$, one tailed). The proportion of audit committee members with nonaccounting financial expertise (NONACCEXP) is also negative but only marginally significant ($p < 0.10$, one-tailed). These results suggest that higher financial expertise of the audit committee reduces the likelihood of MW. ACSIZE is negative and significant ($p < 0.05$, one-tailed), providing empirical support that firms with larger audit committees are more likely to have stronger internal controls. Contrary to expectations, audit committee meeting frequency (ACMEET) is positive and marginally significant ($p < 0.10$, one-tailed). One possible reason for this finding is that the audit committees of the MW firms may have anticipated or become aware of internal control problems prior to their disclosures, and hence, meet more frequently before the disclosures of MW.

Table 4 also shows that the independence of the board of directors (BDINDP), but not the independence of the audit committee (ACINDP), is negatively associated with the

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[26] I also conduct sensitivity test by removing three firms in which the MW disclosed involve ineffective audit committees or boards, for example, the lack of a financial expert on the audit committee. The results are the same as those with these firms in the sample. For parsimonious reasons and for sensitivity checks, I also remove those variables that are found not to be significant in the model (i.e. BLOCKOWN, INSTOWN, LGTA, and GROWTH) and rerun the regression model. The statistical significance levels of the governance variables remain unchanged.

incidence of MW ($p < 0.05$, one-tailed). This finding is consistent with independent board members being more effective monitors of internal controls. Neither board size (BDSIZE), board meeting frequency (BDMEET), or CEO duality (DUALITY) is significantly associated with the incidence of MW. The level of shareholdings held by directors and management (INSIDEOWN) is negatively associated with the incidence of MW ($p < 0.10$, one-tailed), consistent with larger inside ownership resulting in more effective monitoring of internal controls.

ZFC, SEGMENTS, and FOREIGN are positive and significant ($p < 0.05$, one-tailed), suggesting that higher financial distress, more operating segments, and the presence of foreign operations all increase the likelihood of MW. There is also some empirical support that firms undergoing merger, acquisition, or restructuring (MARESTR) are more likely to have MW ($p < 0.10$, one-tailed). Last, LITIGATION is negative and significant ($p < 0.01$), suggesting that operating in a litigious industry reduces the likelihood of MW.

Overall, the results in this section provide some support for Hypothesis 1. In the year before the MW detection, firms with weaker corporate governance structures are more likely to have MW. Specifically, there is strong empirical evidence that firms with a lower proportion of audit committee members with accounting financial expertise, smaller audit committees, and a lower proportion of board members who are independent, are more likely to be associated with the incidence of MW. There is also some empirical support that firms with a lower proportion of audit committee members

with nonaccounting financial expertise are more likely to have MW. The lack of effectiveness in the audit committees and boards of directors of MW firms raises the question of whether these individuals suffer reputational penalties as a result of internal control failures. The next section presents the empirical results on whether these individuals suffer the loss of positions within the firm and the loss of outside directorships. Because top management has responsibilities in ensuring proper internal controls, such reputational penalties for internal control failures should also extend to top management.

Table 5: Descriptive statistics and univariate tests results on the (1) turnover of top management, audit committee members, and outside directors, and (2) loss of outside directorships

		MW firms (n=184)		Control firms (n=184)			
Variable [a]	**Expected Sign**	**Mean**	**Median**	**Mean**	**Median**	**t-statistics**[b]	**Wilcoxon Z**[c]
Financial and governance data							
STKPERF [d]	N.A.	0.56	0.36	0.62	0.40	-0.65	1.56
ZFC	N.A.	0.091	0.0029	0.049	0.00040	2.10**	3.67***
RESTATE	N.A.	0.77	1.00	0.15	0.00	15.2***	11.9***
MGTAGE	N.A.	53.3	54.0	53.7	54.33	-0.46	-0.32
MGTTENURE	N.A.	7.30	5.00	8.10	6.16	-1.19	-1.86*
ACAGE	N.A.	59.2	59.6	58.7	58.9	0.67	0.44
ACTENURE	N.A.	6.17	5.00	6.33	5.87	-0.38	0.83
BDAGE	N.A.	58.6	59.3	58.6	59.0	0.05	0.081
BDTENURE	N.A.	6.35	5.50	6.88	6.33	1.29	-1.76*
Turnover data							
MGTTURNOVER	+	0.51	1.00	0.31	0.00	3.89***	3.81***
ACTURNOVER	+	0.34	0.33	0.19	0.20	5.78***	4.86***
BDTURNOVER	+	0.37	0.33	0.24	0.20	5.68***	4.97***
ACTURNOVER1	+	0.69	1.00	0.57	1.00	2.39***	2.37***
BDTURNOVER1	+	0.83	1.00	0.80	1.00	0.67	0.66
ACTURNOVER2	+	0.32	0.00	0.08	0.00	5.98***	5.71***
BDTURNOVER2	+	0.33	0.00	0.10	0.00	5.39***	5.20***
ACTURNOVER3	+	0.27	0.00	0.04	0.00	6.31***	6.00***
BDTURNOVER3	+	0.25	0.00	0.054	0.00	5.42***	5.22***

Table 5 (continued)

		MW firms (n=184)		Control firms (n=184)			
Variable [a]	**Expected Sign**	**Mean**	**Median**	**Mean**	**Median**	**t-statistics[b]**	**Wilcoxon Z[c]**
Outside directorships data							
ACSEATBEF	N.A.	0.96	0.75	0.84	0.66	1.31*	1.28**
ACSEATAFT	N.A.	0.77	0.66	0.82	0.66	-0.70	0.74
ACSEATLOSS	+	0.19	0.00	0.022	0.00	3.62***	3.66***
BDSEATBEF	N.A.	0.99	0.85	0.84	0.66	1.86**	1.70**
BDSEATAFT	N.A.	0.78	0.66	0.79	0.66	0.16	0.055
BDSEATLOSS	+	0.21	0.11	0.050	0.00	4.18***	3.59***

***, **, * Significant at less than 1 percent, 5 percent, and 10 percent levels, respectively based on one-tailed tests where signs are predicted, and two-tailed tests otherwise.

[a] See APPENDIX B for definitions of independent variables

[b] A two-sample t-test is used to test for significant differences in means between the MW firms and control firms.

[c] A Wilcoxon-Mann-Whitney two-sample test is used to test whether the observations in the MW firms and control firms are from populations with different distributions (i.e. whether the medians are different between the two groups).

[d] Because of extreme observations in this variable, I winsorize the lower tail observations at the 5th percentile value and the upper tail observations at the 95th percentile value. The winsorized values of this variable are used in the regression analyses.

5.2 The Relation between the Incidence of MW and the Turnover of Top Management, Audit Committee Members and Board of Directors (Hypotheses 2a and 2c)

Table 5 reports the descriptive statistics and univariate test results on the differences in financial, governance, and turnover data between the MW firms and control firms. The parametric tests indicate that the MW firms and control firms do not differ in terms of financial performance. The mean buy-and-hold returns over months -12 to +12 relative to the disclosure of MW (STKPERF) are 0.56 and 0.62 for the MW firms and control firms, respectively, but this difference is not statistically significant. However, the MW firms are in higher financial distress than the control firms, as indicated by the ZFC measure ($p < 0.05$, two-tailed). Not surprisingly, the MW firms are more likely to restate their earnings than the control firms. Specifically, 77 percent of the MW firms and 15 percent of the control firms announce at least one earnings restatement from the year before the MW to the second year following the MW detection ($p < 0.01$, two-tailed).

With regards to top management and director data, the parametric tests show that the MW firms and control firms are not significantly different in either the mean age and tenure of their top management (MGTAGE, MGTTENURE), audit committee members (ACAGE, ACTENURE) and outside directors (BDAGE, BDTENURE). However, the non-parametric tests show that the mean tenures of the top management and outside directors in the control firms are significantly greater than those of the MW firms ($p < 0.10$, two-tailed).

Looking at the turnover data, top management turnover (MGTTURNOVER) is significantly higher for the MW firms ($p < 0.01$, one-tailed). Specifically, 51 percent of the MW firms and 31 percent of the control firms have at least one individual holding the positions of CEO, Chairman, and/ or President in the year before the MW detection leave the firm within two years of the MW detection. The proportion of audit committee members (ACTURNOVER) and outside directors (BDTURNOVER) who leave the firm within two years of the MW detection is also significantly higher for the MW firms than for the control firms ($p < 0.01$, one-tailed). Specifically, 34 percent of the audit committee members (37 percent of the outside directors) in the MW firms leave the firm within two years of the MW detection, compared to 19 percent of the audit committee members (24 percent of the outside directors) in the control firms.

The table also shows the univariate comparisons of the turnover rate of audit committee member and outside directors using the indicator variables defined earlier. ACTURNOVER1, ACTURNOVER2, and ACTURNOVER3, are indicator variables coded 1 if at least one audit committee member, at least half of the audit committee members, and more than half of the audit committee members, respectively, leave the firms within two years of the MW detection, and 0 otherwise. BDTURNOVER1, BDTURNOVER2, and BDTURNOVER3 are indicator variables defined similarly for the outside directors.

The results using the indicator variables are consistent with the turnover data using proportions. Sixty-nine percent of the MW firms, compared to 57 percent of the control firms, have *at least* one audit committee member leaving the firm within two years of the MW detection. Also, 32 percent (33 percent) of the MW firms and 8 percent (10 percent) of the control firms have *at least half* the audit committee members (outside directors) leave the firm within two years of the MW detection. Last, 27 percent (25 percent) of the MW firms and 4 percent (5.4 percent) of the control firms have *more than half* of the audit committee members (outside directors) leave the firm within two years of the MW detection. All these differences in turnover between the MW firms and control firms are significant ($p < 0.01$, one-tailed).

The univariate results show that top management, audit committee members, and outside directors in the MW firms experience turnover at a rate greater than their counterparts in the control firms. I test these results more rigorously using logistic regression models. Table 6 presents the Pearson correlations of the independent variables. Just as the results of examining the incidence of MW, the correlation coefficients among the independent variables range from -0.33 (between INSTOWN and LGTA) to 0.64 (between BLOCKOWN and INSIDEOWN). The correlation coefficient between MWF and RESTATE is also high at 0.62. The VIFs of all the independent variables in each of the regression models examined in this section are under 2.5, suggesting that multicollinearity is not a concern.

Table 6: Pearson correlation coefficients among independent variables

Variables[a]	MWF	STKPERF	ZFC	RESTATE	LGTA	MARESTR	DUALITY	BLOCKOWN	INSIDEOWN
MWF	1.00	-0.033	0.10**	0.62***	0.017	0.11**	0.070	-0.081	-0.084
STKPERF		1.00	-0.030	-0.021	-0.13**	-0.076	-0.033	0.13***	0.081
ZFC			1.00	0.087*	-0.046	-0.00088	0.018	0.12**	0.016
RESTATE				1.00	0.12**	0.091*	0.00054	-0.050	-0.046
LGTA					1.00	0.13**	-0.21***	-0.27***	-0.33***
MARESTR						1.00	-0.052	-0.096*	-0.19***
DUALITY							1.00	-0.034	0.014
BLOCKOWN								1.00	0.64***
INSIDEOWN									1.00
INSTOWN									
MGTAGE									
MGTTENURE									
ACAGE									
ACTENURE									
BDAGE									
BDTENURE									
ACSEATBEF									
BDSEATBEF									

(continued on next page)

Table 6 (Continued)

Variables[a]	INSTOWN	MGTAGE	MGTTENURE	ACAGE	ACTENURE	BDAGE	BDTENURE	ACSEATBEF	BDSEATBEF
MWF	-0.058	-0.023	-0.062	0.035	-0.020	0.0026	-0.067	0.068	0.096*
STKPERF	-0.18***	-0.0058	0.043	0.0023	-0.041	-0.0045	-0.055	-0.0088	-0.067
ZFC	-0.084	-0.088*	-0.080	-0.074	-0.11**	-0.070	-0.099*	-0.023	-0.027
RESTATE	0.070	0.037	-0.051	0.0068	0.0017	-0.0036	-0.036	0.049	0.070
LGTA	0.36	0.16***	-0.025	0.14***	0.13	0.19***	0.13***	0.26***	0.34***
MARESTR	0.15***	-0.092*	-0.17***	-0.067	-0.10**	-0.052	-0.15***	-	-
DUALITY	-0.18***	-0.036	-0.17***	-0.040	-0.015	-0.056	0.010	-	-
BLOCKOW	-0.035	-0.053	0.19***	-0.12**	-0.11**	-0.14***	-0.049	-	-
INSIDEOWN	-0.27***	-0.045	0.23***	-0.12**	-0.11**	-0.16***	-0.023	-	-
INSTOWN	1.00	0.0077	-0.087*	0.080	0.068	0.10**	0.0062	-	-
MGTAGE		1.00	0.43***	-	-	-	-	-	-
MGTTENUR			1.00	-	-	-	-	-	-
ACAGE				1.00	0.44***	-	-	0.074	-
ACTENURE					1.00	-	-	-0.070	-
BDAGE						1.00	0.43***	-	0.025
BDTENURE							1.00	-	-0.11**
ACSEATBEF								1.00	0.81
BDSEATBEF									1.00

***, **, * Significant at less than 1 percent, 5 percent, and 10 percent levels, respectively based on two-sided tests.

[a] See APPENDIX B for definitions of independent variables

Table 7: Logistic regression results on the turnover of top management

Pr (MGTTURNOVER=1) = $a + b_1MWF + b_2STKPERF + b_3ZFC + b_4RESTATE + b_5LGTA + b_6MARESTR + b_7MGTAGE + b_8MGTTENURE + b_9DUALITY + b_{10}BLOCKOWN + b_{11}INSIDEOWN + b_{12}INSTOWN + \varepsilon$

	Expected sign	**Model 1**	
Variable[a]		**Coefficient Estimates**	**Wald Chi-squared**
Intercept	?	-1.46	2.22
MWF	+	0.55	3.54*
STKPERF	-	-0.33	6.34**
ZFC	+	0.41	0.49
RESTATE	+	0.27	0.87
LGTA	?	0.0020	0.0007
MARESTR	+	0.54	4.90**
MGTAGE	+	0.018	1.25
MGTTENURE	-	-0.064	8.06***
DUALITY	+	0.038	0.045
BLOCKOWN	+	-0.0020	0.067
INSIDEOWN	+	-0.0015	0.025
INSTOWN	+	0.083	0.027
Likelihood ratio		45.6	
(p-value)		(<.0001)	
Pseudo R-squared		0.15	
n		368	

***, **, * Significant at 1 percent, 5 percent, and 10 percent levels respectively, based on one-tailed tests where signs are predicted, two-tailed tests otherwise.

[a] See APPENDIX B for definitions of independent variables. The dependent variable is an indicator variable that is coded 1 if any individual holding the title of CEO, Chairman, and/or President in the year before the MW detection, leaves the firm within two years of the MW detection, and 0 otherwise.

Table 7 presents the logistic regression results examining the relation between the incidence of MW and top management turnover. The dependent variable, MGTTURNOVER, is coded 1 if at least one individual holding the positions of CEO, Chairman, and/ or President in the year before the MW detection leaves the firm within two years of the MW detection. Just as before, MWF is an indicator variable coded 1 for

MW firms 0 for control firms. The model is significant, as indicated by the Chi-squared value of the likelihood ratio.

Consistent with the results in the univariate tests, MWF is positive and marginally significant ($p < 0.10$, one-tailed). This result provides some empirical support that the MW firms are more likely to experience turnover of at least one top management following the MW detection compared to the control firms, and is consistent with reputational penalties being imposed on top management subsequent to the discovery of MW. Stock performance (STKPERF) is negative and significant ($p < 0.05$, one-tailed), consistent with the interpretation that top management is more likely to leave the firm as a result of poor financial performance. Among the other control variables, the presence of mergers, acquisitions, or restructuring (MARESTR) and shorter top management tenures (MGTTENURE) also increase the likelihood of top management turnover ($p < 0.05$, one-tailed).

Table 8: Logistic regression results on the turnover of audit committee members

Pr (ACTURNOVER1/ACTURNOVER2/ACTURNOVER3=1) = $a + b_1MWF + b_2STKPERF + b_3ZFC + b_4RESTATE + b_5LGTA + b_6MARESTR + b_7ACAGE + b_8ACTENURE + b_9DUALITY + b_{10}BLOCKOWN + b_{11}INSIDEOWN + b_{12}INSTOWN + \varepsilon$

	Expected sign	Model 1		Model 2		Model 3	
Variable [a]		Coefficient Estimates	Wald Chi-squared	Coefficient Estimates	Wald Chi-squared	Coefficient Estimates	Wald Chi-squared
Intercept	?	-1.42	1.43	-3.97	6.82***	-6.52	13.3***
MWF	+	0.47	2.66*	1.67	18.3***	1.97	17.3***
STKPERF	-	0.011	0.0076	-0.20	1.47	-0.47	5.20**
ZFC	+	0.26	0.18	1.54	5.58**	1.04	2.20
RESTATE	+	-0.083	0.081	-0.20	0.32	0.0010	0.00
LGTA	+	0.19	6.48**	0.082	0.78	0.044	0.18
MARESTR	+	0.39	2.70	0.23	0.54	0.37	1.07
ACAGE	+	0.0044	0.055	0.0099	0.17	0.043	2.49
ACTENURE	-	0.0088	0.080	0.030	0.69	0.016	0.15
DUALITY	+	0.29	1.78	0.51	3.41*	0.69	4.43**
BLOCKOWN	+	0.0019	0.068	-0.0059	0.36	0.00013	0.0002
INSIDEOWN	+	-0.012	1.77	-0.0045	0.11	-0.0013	0.0080
INSTOWN	+	-0.063	0.017	0.34	0.29	0.20	0.076
Likelihood ratio		27.4***		52.6***		61.8***	
(p-value)		(0.0067)		(<.0001)		(<.0001)	
Pseudo R-squared		0.11		0.21		0.27	
n		368		368		368	

***, **, * Significant at 1 percent, 5 percent, and 10 percent levels respectively, based on one-tailed tests where signs are predicted, two-tailed tests otherwise.
[a] See APPENDIX B for definitions of independent variables.

Table 8 presents the logistic regression results on the relation between the incidence of MW and the turnover of audit committee members. The dependent variables in Models 1, 2, and 3 are indicator variables that are coded 1 if at least one audit committee member (ACTURNOVER1), at least half of the audit committee members (ACTURNOVER2), and more than half of the audit committee members (ACTURNOVER3), respectively, leave the firm within two years of the MW detection, and 0 otherwise. All the models are significant, as indicated by the Chi-squared values of their likelihood ratios.

MWF is positive and significant in Models 2 and 3 ($p < 0.01$, one-tailed), providing empirical support that the audit committee members in the MW firms are more likely to leave the firm following the MW detection than their counterparts in the control firms. In Model 1, MWF is also positive and significant, albeit at a lower significance level ($p < 0.10$, one-tailed). ZFC is positive and significant in Model 2 ($p < 0.05$, one-tailed), and STKPERF is negative and significant in Model 3 ($p < 0.05$, one-tailed), suggesting that poor financial health increases the likelihood of audit committee members leaving the firm. DUALITY is positive and significant in Models 2 and 3 ($p < 0.10$ and $p < 0.05$, respectively, one-tailed) and LGTA is positive and significant in Model 1 ($p < 0.05$, one-tailed), suggesting that the turnover rate of audit committee members is higher for firms in which the CEO and Chairman positions are held by different individuals and for larger firms.

Table 9: Logistic regression results on the turnover of outside directors

Pr (BDTURNOVER1/BDTURNOVER2/BDTURNOVER3=1) = $a + b_1MWF + b_2STKPERF + b_3ZFC + b_4RESTATE + b_5LGTA + b_6MARESTR + b_7BDAGE + b_8BDTENURE + b_9DUALITY + b_{10}BLOCKOWN + b_{11}INSIDEOWN + b_{12}INSTOWN + \varepsilon$

	Expected sign	Model 1		Model 2		Model 3	
Variable [a]		Coefficient Estimates	Wald Chi-squared	Coefficient Estimates	Wald Chi-squared	Coefficient Estimates	Wald Chi-squared
Intercept	?	1.24	0.53	-2.40	2.04	-5.45	7.29***
MWF	+	0.021	0.0034	1.36	13.5***	1.99	18.7***
STKPERF	-	-0.10	0.42	-0.28	2.91*	-0.45	4.80**
ZFC	+	0.51	0.36	1.33	4.57**	1.51	4.81**
RESTATE	+	0.014	0.0016	-0.047	0.018	-0.49	1.48
LGTA	+	0.37	12.5***	0.13	2.29	0.10	0.92
MARESTR	+	0.74	6.44**	0.29	0.90	0.45	1.50
BDAGE	+	-0.042	2.26	-0.016	0.34	0.016	0.26
BDTENURE	-	0.034	0.68	-0.0091	0.053	-0.018	0.15
DUALITY	+	0.54	3.19*	0.41	2.70*	0.42	2.56
BLOCKOWN	+	0.0067	0.48	0.0015	0.026	0.0054	0.25
INSIDEOWN	+	-0.0018	0.025	-0.0019	0.025	0.0048	0.11
INSTOWN	+	-1.11	3.18*	0.16	0.067	0.97	1.75
Likelihood ratio		27.4***		44.7***		51.1***	
(p-value)		(0.0067)		(<.0001)		(<.0001)	
Pseudo R-squared		0.12		0.18		0.22	
n		368		368		368	

***, **, * Significant at 1 percent, 5 percent, and 10 percent levels respectively, based on one-tailed tests where signs are predicted, two-tailed tests otherwise.
[a] See APPENDIX B for definitions of independent variables.

Table 9 presents the logistic regression results by repeating the above analyses, but focusing on the turnover of outside directors. The dependent variables in Models 1, 2, and 3 are indicator variables that are coded 1 if at least one outside director (BDTURNOVER1), at least half of the outside directors (BDTURNOVER2), and more than half of the outside directors (BDTURNOVER3), respectively, in the year before the MW detection leave the firm within two years of the MW detection, and 0 otherwise. All the models are significant, as indicated by the Chi-squared values of their likelihood ratios.

The results are similar to those of the turnover of audit committee members. The variable MWF is positive and significant in Models 2 and 3 ($p < 0.01$, one-tailed), suggesting that the incidence of MW increases the likelihood of outside directors leaving the firm within two years of the MW detection. The variable MWF is not significant in Model 1. The fact that MWF is very significant in Models 2 and 3, but not significant in Model 1, provides compelling evidence of the effect that MW detection has on the outside directors.

In Models 2 and 3, STKPERF is negative and significant ($p < 0.10$ and $p < 0.05$, respectively, one-tailed), and ZFC is positive and significant ($p < 0.05$, one-tailed), consistent with poor financial health increasing the likelihood of outside directors turnover. Consistent with the results in audit committee turnover, LGTA is positive and significant in Model 1 ($p < 0.01$, one-tailed) and DUALITY is positive and marginally significant in Models 1 and 2 ($p < 0.10$, one-tailed). Contrary to expectations,

INSTOWN is negative and significant in Model 1, suggesting that institutional ownership is negatively associated with the likelihood of outside directors turnover. Last, MARESTR is positive and significant in Model 1 ($p < 0.05$, one-tailed), consistent with mergers, acquisitions, or restructuring increasing the likelihood of outside directors turnover.

The results thus far have focused on the statistical significance of MWF. However, it is also important to evaluate the economic significance of MWF to examine the practical effects of the incidence of MW. This can be achieved by computing the increase in the probability of the turnover of these individuals as a result of the incidence of MW. In the top management turnover model, the results (not tabulated) show that the incidence of MW increases the probability of turnover of at least one of the top three management positions by 0.13. I compute similar probability for the turnover of more than half the audit committee members (ACTURNOVER3) and outside directors (BDTURNOVER3). The results (not tabulated) show that the probability for the turnover of more than half the audit committee members and outside directors increases by 0.19 and 0.20, respectively, as a result of the incidence of MW. These results suggest that the incidence of MW has a great economic impact on the turnover of those individuals charged with internal control monitoring.

Overall the univariate test and regression results provide some support for Hypothesis 2a in that the incidence of MW increases the likelihood of turnover of top management. The results provide strong support for Hypothesis 2c in that the incidence

of MW increases the likelihood of turnover of audit committee members and outside directors. The turnover of these individuals is consistent with reputational penalties being imposed on these individuals within the firm for internal control failures. If internal control failures reveal the lower quality of the audit committees and outside directors in monitoring, and the labor market can infer this quality, then reputational penalties can extend to the loss of the outside directorships. The next section presents the empirical results on whether the audit committee members and outside directors in the MW firms indeed suffer greater losses in outside directorships than their counterparts in the control firms.

5.3 The Relation between the Incidence of MW and the Loss in Outside Directorships (Hypotheses 2b)

The descriptive statistics on the outside directorships held by the audit committee and outside directors in both the MW firms and control firms are presented in Table 5. An interesting finding is that the outside directors of the MW firms hold significantly more outside directorships than their counterparts in the control firms prior to the MW detection ($p < 0.05$, one tailed for BDSEATBEF). It also appears that the audit committee members of the MW firms hold more outside directorships than their counterparts in the control firms prior to the MW detection ($p < 0.10$, one-tailed for ACSEATBEF). These results suggest that more outside directorships by the audit committee members and outside directors may reduce their commitment and effectiveness in monitoring the firm, which may in turn explain the greater incidence of MW in these firms.

The descriptive statistics on ACSEATLOSS and BDSEATLOSS show that both the audit committee members and outside directors of the MW firms and control firms lose directorships during the three-year period surrounding the MW detection. One possible reason for this result is the greater frequency of companies going private subsequent to the passage of SOX, which results in outside directors losing directorships in public companies. Another possible reason is that the high litigation costs facing outside directors subsequent to SOX may have caused them to give up their directorships voluntarily in order to avoid such costs.

The descriptive statistics show that the audit committee members of the MW firms and control firms lose an average of 0.19 and 0.022 outside directorships, respectively (ACSEATLOSS). The outside directors of the MW firms and control firms lose an average of 0.21 and 0.05 outside directorships, respectively (BDSEATLOSS). Both the differences in ACSEATLOSS and BDSEATLOSS between the MW firms and control firms are significant ($p < 0.01$, one-tailed). Finally, in the second year following the MW detection, the mean number of outside directorships held by audit committee members (ACSEATAFT) and outside directors (BDSEATAFT) in the MW firms and control firms are not significantly different.

Table 10: OLS regression results on the loss of outside directorships

ACSEATLOSS (BDSEATLOSS) = $a + b_1$MWF + b_2STKPERF + b_3ZFC + b_4RESTATE + b_5LGTA + b_6ACSEATBEF (BDSEATBEF) + b_7ACAGE (BDAGE) + b_8ACTENURE (BDTENURE) + ε

	Expected sign	**Model 1**		**Model 2**	
Variable [a]		**Coefficient Estimates**	**t-statistics [b]**	**Coefficient Estimates**	**t-statistics [b]**
Intercept	?	-0.21	-1.13	-0.22	-1.06
MWF [a]	+	0.18	3.51***	0.14	3.63***
STKPERF	-	-0.00091	-0.04	0.0062	0.33
ZFC	+	0.083	0.93	0.077	1.19
RESTATE	+	-0.066	-1.22	-0.041	-1.01
LGTA	+	-0.029	-2.27**	-0.014	-1.48
ACSEATBEF	+	0.25	5.94***		
ACAGE	+	0.0022	0.70		
ACTENURE	-	0.012	2.47**		
BDSEATBEF	+			0.26	9.88***
BDAGE	+			0.0015	0.45
BDTENURE	-			0.0071	2.03**
Adjusted R-squared		0.30		0.24	
n		368		368	

***, **, * Significant at 1 percent, 5 percent, and 10 percent levels respectively, based on one-tailed tests where signs are predicted, two-tailed tests otherwise.

[a] See APPENDIX B for definitions of independent variables. The dependent variables, ACSEATLOSS (Model 1) and BDSEATLOSS (Model 2) represent the number of outside directorships in other public companies lost by the audit committee members and outside directors, respectively, from the year before the MW detection to the second year following the MW detection.

[b] The Breusch-Pagan test shows the presence of heteroskedasticity. Hence, the t-statistics that are robust to heteroskedasticity are computed.

Table 10 shows the OLS regression results on the relation between the incidence of MW and the loss of outside directorships by audit committee members (Model 1) and outside directors (Model 2). The dependent variables in Models 1 and 2 represent the loss in outside directorships by the audit committee members and outside directors, respectively, from the year before the MW detection to the second year following the MW detection. An interesting finding from the regression results is that the adjusted R-squared for both models are high at 30 percent and 24 percent, suggesting a very high goodness-of-fit for both models.

Consistent with the results in the univariate tests, MWF is positive and significant in both models ($p < 0.01$, one-tailed), suggesting that the incidence of MW increases the number of outside directorships lost by both audit committee members and outside directors. ACSEATBEF and BDSEATBEF are both positive and significant ($p < 0.01$, one-tailed), consistent with the loss of outside directorships increasing with the number of outside directorships held before the MW detection. Contrary to expectations, ACTENURE is positive and significant in Model 1 ($p < 0.05$, one-tailed) and BDTENURE is positive and significant in Model 2 ($p < 0.05$, one-tailed). This result suggests that longer tenures of the audit committee members and outside directors on the board increase the number of outside directorships lost by these individuals. One possible explanation for this finding is that longer tenures increase the bond and commitment of these individuals to the firm, which in turn increases the likelihood of them losing or giving up directorships in other firms as opposed to the MW firms.

As a whole, the results in this section support Hypothesis 2b and complement the findings in the previous section. The reputational penalties imposed on audit committee members and outside directors for internal control failures extend from the loss of positions in the MW firms to the loss of outside directorships in other public companies. In the next section, I present the empirical results on whether the reputational penalties faced by top management, audit committee members, and outside directors, increase with the severity, pervasiveness, and persistence of the MW.

5.4 The Relation between the Severity, Pervasiveness, and Persistence of MW, and the Reputational Penalties of Top Management, Audit Committee Members, and Outside Directors (3a, 3b)

Panel A of Table 11 provides the descriptive statistics and univariate test results on the turnover and loss in outside directorship data, stratified by the severity (SEVERE), pervasiveness (PERVADE), and persistence (PERSIST) of the firm's MW. For PERVADE, I classify the MW firms based on whether the number of different categories of MW the firm has is less than the median of all MW firms, or greater than or equal to the median of all the MW firms. I use all the turnover and loss in outside directorship variables from Sections 5.2 and 5.3, except for ACTURNOVER1 and BDTURNOVER1, because the earlier results provide little empirical support that the turnover of audit committee members and outside directors based on these measures is sensitive to the incidence of MW.

Table 11: Relation between the severity, pervasiveness, and persistence of MW and the reputational penalties on top management, audit committee members, and outside directors

Panel A: Descriptive statistics and univariate tests

		Severity of MW (SEVERE)[a]			Pervasiveness of MW (PERVADE)[b]			Persistence of MW (PERSIST)[c]		
Variable[d]	**Expected Sign**	**SEVERE=1 (n=77)**	**SEVERE=0 (n=107)**	**t-stats[e]**	**≥ Median (n=94)**	**< Median (n=90)**	**t-stats[e]**	**PERSIST=1 (n=51)**	**PERSIST=0 (n=133)**	**t-stats[e]**
Turnover data										
MGTTURNOVER	+	0.65	0.40	3.40***	0.62	0.39	3.16***	0.64	0.45	2.40***
ACTURNOVER	+	0.41	0.29	2.65***	0.36	0.31	0.98	0.36	0.33	0.52
BDTURNOVER	+	0.44	0.32	2.98***	0.39	0.35	1.20	0.39	0.36	0.69
ACTURNOVER2	+	0.40	0.26	2.03**	0.36	0.28	1.22	0.39	0.29	1.29*
BDTURNOVER2	+	0.40	0.27	1.89**	0.34	0.31	0.42	0.37	0.31	0.83
ACTURNOVER3	+	0.32	0.23	1.37*	0.30	0.24	0.81	0.37	0.23	1.91**
BDTURNOVER3	+	0.34	0.19	2.35***	0.26	0.23	0.51	0.29	0.23	0.85
Outside directorships data										
ACSEATLOSS	+	0.29	0.12	2.30***	0.23	0.16	1.03	0.17	0.20	-0.24
BDSEATLOSS	+	0.27	0.16	1.80**	0.26	0.15	1.88**	0.24	0.20	0.49

***, **, * Significant at 1 percent, 5 percent, and 10 percent levels respectively, based on one-tailed tests.

[a] SEVERE is an indicator variable that is coded 1 if the firm has one or more severe MW, and 0 otherwise. Severe MW is defined in APPENDIX C.

[b] PERVADE is the total number of different categories of MW that a MW firm has. I classify the MW firms based on whether PERVADE is less than the median of all MW firms, or greater than or equal to the median of all MW firms.

[c] PERSIST is an indicator variable that is coded 1 if MW are not remediated within two years of the MW detection, and 0 otherwise.

[d] See APPENDIX B for definitions of variables.

[e] A two-sample t-test is used to test for significant differences in means between each sub-samples of firms.

Table 11 (continued)

Panel B: Regression results

	Management turnover [a]		Audit committee turnover [a]				Outside directors turnover [a]				Audit committee loss of outside directorships [a]		Outside directors loss of outside directorships [a]	
	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
Variables [b]	Coeff. Est.	Wald Ch-sq	Coeff. Est.	Wald Ch-sq	Coeff. Est.	Wald Ch-sq	Coeff. Est.	Wald Ch-sq	Coeff. Est.	Wald Ch-sq	Coeff. Est.	t-stats [c]	Coeff. Est.	t-stats [c]
SEVERE	0.63	1.90	0.92	4.10**	0.67	1.97	0.93	4.27**	1.13	5.34**	0.17	2.27**	0.084	1.51*
PERVADE	0.11	1.77	-0.085	1.09	-0.094	1.16	-0.11	1.87	-0.066	0.55	0.0010	0.09	0.011	1.14
PERSIST	0.27	0.36	0.40	0.89	0.70	2.50	0.30	0.48	0.15	0.10	-0.067	-0.90	-0.0095	-0.02
Likelihood Ratio	39.3***		26.3**		29.01***		22.8*		30.3***					
(p-value)	(0.0003)		(0.023)		(0.010)		(0.062)		(0.0069)					
R-squared [d]	0.26		0.19		0.21		0.16		0.22		0.29		0.40	
n	184		184		184		184		184		184		184	

***, **, * Significant at 1 percent, 5 percent, and 10 percent levels respectively, based on one-tailed tests

[a] Model 1 repeats the analyses in Table 8 by replacing MWF with SEVERE, PERVADE, and PERSIST. Models 2 and 3 repeat the analyses in Models 2 and 3 of Table 8 by replacing MWF with SEVERE, PERVADE, and PERSIST. Models 4 and 5 repeat the analyses in Models 2 and 3 of Table 9 by replacing MWF with SEVERE, PERVADE, and PERSIST. Models 6 and 7 repeat the analyses in Models 1 and 2 of Table 10 by replacing MWF with SEVERE, PERVADE, and PERSIST.

[b] SEVERE is an indicator variable that is coded 1 if the firm has one or more severe MW, and 0 otherwise. Severe MW is defined in APPENDIX C. PERVADE is the total number of different categories of MW that a MW firm has. PERSIST is an indicator variable that is coded 1 if MW are not remediated within two years from the MW detection, and 0 otherwise.

[c] The Breusch-Pagan test shows the presence of heteroskedasticity. Hence, the t-statistics that are robust to heteroskedasticity are computed.

[d] Psuedo R-squared values are given for the case of logistic model and adjusted R-squared values for the case of OLS.

The panel shows that MW firms that have one or more severe MW suffer significantly higher turnover of top management, audit committee members, and outside directors, than MW firms that do not ($p < 0.05$, one-tailed, for all variables except ACTURNOVER3, in which $p < 0.10$, one-tailed). Audit committee members and outside directors in firms that have one or more severe MW also suffer greater loss in outside directorships than their counterparts in firms that do have severe MW ($p < 0.05$, one-tailed). Although firms that have more pervasive MW experience greater turnover of top management than firms that do not ($p < 0.01$, one-tailed), the turnover of audit committee members and outside directors between the two groups of firms are not statistically different. Outside directors in firms that have more pervasive MW also experience greater loss in outside directorships than their counterparts in firms that have less pervasive MW ($p < 0.05$, one-tailed). Last, the univariate test results show that firms with more persistent MW experience greater turnover of top management than firms with less persistent MW ($p < 0.01$, one-tailed). There is also some evidence that these firms experience greater turnover of audit committee members ($p < 0.10$, one-tailed, for ACTURNOVER2 and $p < 0.05$, one tailed for ACTURNOVER3).

I test more rigorously the relation between the severity, pervasiveness, and persistence of MW, and the reputational penalties of top management, audit committee members and outside directors. I repeat the regression analyses in Tables 7 to 10 by replacing the variable MWF with SEVERE, PERVADE, and PERSIST. Hence, the regression tests are now performed on the 184 firms with MW. For brevity, Panel B of Table 11 only shows the results for SEVERE, PERVADE, and PERSIST. For the same

reasons mentioned earlier, I do not perform regression tests using ACTURNOVER1 and BDTURNOVER1. The panel shows that Models 1 to 5 are significant, as indicated by the Chi-squared values of their likelihood ratios. The R-squared values for all the models range from 0.16 to 0.41, suggesting high goodness-of-fit for the models.

Consistent with the univariate test results, firms that have one or more severe MW are more likely to experience turnover of audit committee members ($p < 0.05$, one-tailed in Model 2) and outside directors ($p < 0.05$, one-tailed, in Models 4 and 5). SEVERE is significant in Model 6 ($p < 0.05$, one-tailed) and marginally significant in Model 7 ($p < 0.10$, one-tailed), providing some support that the severity of the firm's MW is positively associated with the loss in the outside directorships of audit committee members and outside directors. PERVADE and PERSIST are not statistically significant in any of the models based on conventional levels.

Overall, the results in this section and in two preceding sections are consistent with the interpretation that the managerial labor market imposes reputational penalties on top management, audit committee members, and outside directors for internal control failures. These individuals are more likely to leave the firm within two years of the MW detection. Audit committee members and outside directors in MW firms also lose more outside directorships subsequent to the MW detection than their counterparts in firms without internal control weaknesses. Further analyses show that the turnover of audit committee members and outside directors, and their loss in outside directorships, increase with the severity of the firm's MW. In the next section, I present the empirical results on

whether there is an overall improvement in the governance structures of the MW firms. Specifically, I examine whether the effectiveness of the audit committee and board of directors of the MW firms improve after the MW detection.

5.5 The Relation between the Incidence of MW and Improvement in Corporate Governance Structures (Hypothesis 4)

Panels A and B of Table 12 present the univariate comparisons of the changes in audit committee and overall board characteristics, respectively, from the year before the MW detection up to the second year following the MW detection. Columns 1 to 4 show the governance characteristic for the year relative to the year of MW detection (Year t). Columns 5, 6, and 7 show the change in each governance characteristic from Year t-1 to Year t, Year t+1, Year t+2, respectively. Column 8 shows that the t-statistics for the change in the governance characteristic from Year t-1 to Year t+2. A high t-statistic would suggest that the firm improves significantly on a particular governance characteristic.

Table 12: Univariate comparisons of the changes in audit committee and overall board characteristics from the year before the MW detection up to the second year following the MW detection

Panel A: Audit committee characteristics

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variable[a]	**Firm**	**Year t-1**	**Year t**	**Year t+1**	**Year t+2**	**Change, Year t-1 to t**	**Change, Year t-1 to t+1**	**Change, Year t-1 to t+2**	**t-statistics for (7)**
ACINDP	MW	0.72	0.84	0.90	0.90	0.12	0.18	0.18	5.72***
	Control	0.82	0.89	0.90	0.92	0.076	0.087	0.11	3.92***
	(t-stats)[b]	*-2.23***	*-1.52**	*-0.17*	*-0.91*	*1.23*	*2.27***	*1.69***	
ACCEXP	MW	0.14	0.21	0.24	0.28	0.068	0.098	0.13	7.98***
	Control	0.20	0.23	0.26	0.29	0.026	0.054	0.086	6.42***
	(t-stats)[b]	*-2.68****	*-0.62*	*-0.56*	*-0.41*	*3.43****	*2.41****	*2.17***	
NONACCEXP	MW	0.66	0.66	0.68	0.66	-0.003	0.012	0.0029	0.16
	Control	0.70	0.71	0.70	0.70	0.0099	0.0035	0.0096	0.65
	(t-stats)[b]	*-1.18*	*-1.69***	*-0.90*	*-1.50**	*-0.74*	*0.40*	*-0.28*	
ACSIZE	MW	3.41	3.60	3.63	3.61	0.195	0.22	0.21	3.30***
	Control	3.60	3.60	3.61	3.67	-0.005	0.0054	0.071	1.30*
	(t-stats)[b]	*-2.16***	*0.06*	*0.23*	*-0.58*	*3.26****	*2.93****	*1.68***	
ACMEET	MW	6.36	8.16	12.2	11.1	1.80	5.88	4.72	11.5***
	Control	6.00	7.04	7.99	8.04	1.04	1.99	2.04	9.45***
	(t-stats)[b]	*1.22*	*3.19****	*6.59****	*6.62****	*2.41****	*6.25****	*5.74****	

Columns 1 to 4 show the governance characteristic for the year relative to the year of MW detection (Year t). Columns 5, 6, and 7 show the change in each governance characteristic from Year t-1 to Year t, Year t+1, Year t+2, respectively. Column 8 shows the t-statistics for the change in the governance characteristic from Year t-1 to Year t+2.

***, **, * Significant at less than 1 percent, 5 percent, and 10 percent levels, respectively based on one-tailed tests.

[a] See APPENDIX B for definitions of variables

[b] A two-sample t-test is used to test for significant differences in means between the MW firms and control firms.

Table 12: Univariate comparisons of the changes in audit committee and overall board characteristics from the year before the MW detection up to the second year following the MW detection

Panel A: Audit committee characteristics

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variable[a]	**Firm**	**Year t-1**	**Year t**	**Year t+1**	**Year t+2**	**Change, Year t-1 to t**	**Change, Year t-1 to t+1**	**Change, Year t-1 to t+2**	**t-statistics for (7)**
ACINDP	MW	0.72	0.84	0.90	0.90	0.12	0.18	0.18	5.72***
	Control	0.82	0.89	0.90	0.92	0.076	0.087	0.11	3.92***
	(t-stats)[b]	*-2.23***	*-1.52**	*-0.17*	*-0.91*	*1.23*	*2.27***	*1.69***	
ACCEXP	MW	0.14	0.21	0.24	0.28	0.068	0.098	0.13	7.98***
	Control	0.20	0.23	0.26	0.29	0.026	0.054	0.086	6.42***
	(t-stats)[b]	*-2.68****	*-0.62*	*-0.56*	*-0.41*	*3.43****	*2.41****	*2.17***	
NONACCEXP	MW	0.66	0.66	0.68	0.66	-0.003	0.012	0.0029	0.16
	Control	0.70	0.71	0.70	0.70	0.0099	0.0035	0.0096	0.65
	(t-stats)[b]	*-1.18*	*-1.69***	*-0.90*	*-1.50**	*-0.74*	*0.40*	*-0.28*	
ACSIZE	MW	3.41	3.60	3.63	3.61	0.195	0.22	0.21	3.30***
	Control	3.60	3.60	3.61	3.67	-0.005	0.0054	0.071	1.30*
	(t-stats)[b]	*-2.16***	*0.06*	*0.23*	*-0.58*	*3.26****	*2.93****	*1.68***	
ACMEET	MW	6.36	8.16	12.2	11.1	1.80	5.88	4.72	11.5***
	Control	6.00	7.04	7.99	8.04	1.04	1.99	2.04	9.45***
	(t-stats)[b]	*1.22*	*3.19****	*6.59****	*6.62****	*2.41****	*6.25****	*5.74****	

Columns 1 to 4 show the governance characteristic for the year relative to the year of MW detection (Year t). Columns 5, 6, and 7 show the change in each governance characteristic from Year t-1 to Year t, Year t+1, Year t+2, respectively. Column 8 shows the t-statistics for the change in the governance characteristic from Year t-1 to Year t+2.

***, **, * Significant at less than 1 percent, 5 percent, and 10 percent levels, respectively based on one-tailed tests.

[a] See APPENDIX B for definitions of variables

[b] A two-sample t-test is used to test for significant differences in means between the MW firms and control firms.

Table 12 (continued)

Panel B: Overall board characteristics

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variable[a]	**Firm**	**Year t-1**	**Year t**	**Year t+1**	**Year t+2**	**Change, Year t-1 to t**	**Change, Year t-1 to t+1**	**Change, Year t-1 to t+2**	**t-statistics for (7)**
BDINDP	MW	0.62	0.67	0.71	0.73	0.047	0.094	0.11	10.1***
	Control	0.69	0.70	0.72	0.74	0.018	0.037	0.052	4.93***
	(t-stats)[b]	*-3.83****	*-2.47****	*-0.64*	*-0.92*	*2.73****	*3.63****	*3.71****	
BDSIZE	MW	8.20	8.30	8.22	8.21	0.098	0.016	0.0054	0.04
	Control	8.22	8.37	8.37	8.45	0.15	0.15	0.23	2.19**
	(t-stats)[b]	*-0.07*	*-0.31*	*-0.69*	*-1.07*	*-0.47*	*-0.92*	*-1.33**	
BDMEET	MW	7.85	8.73	9.93	9.73	0.88	2.08	1.89	4.46***
	Control	7.50	7.48	7.65	7.85	0	0.16	0.36	1.32*
	(t-stats)[b]	*0.83*	*2.81****	*4.19****	*4.08****	*2.17***	*3.59****	*3.01****	
DUALITY	MW	0.46	0.44	0.45	0.58	-0.016	-0.005	0.13	1.53*
	Control	0.36	0.39	0.44	0.42	0.027	0.076	0.060	1.99**
	(t-stats)[b]	*1.34**	*0.95*	*0.21*	*2.16***	*-0.75*	*-1.25*	*0.75*	

Columns 1 to 4 show the governance characteristic for the year relative to the year of MW detection (Year t). Columns 5, 6, and 7 show the change in each governance characteristic from Year t-1 to Year t, Year t+1, Year t+2, respectively. Column 8 shows the t-statistics for the change in the governance characteristic from Year t-1 to Year t+2.

***, **, * Significant at less than 1 percent, 5 percent, and 10 percent levels, respectively based on one-tailed tests.

[a] See APPENDIX B for definitions of variables

[b] A two-sample t-test is used to test for significant differences in means between the MW firms and control firms.

Panel A shows that, in the year prior to the MW detection, MW firms have lower proportion of audit committee members who are independent ($p < 0.05$, one-tailed), lower proportion of audit committee members with accounting financial expertise ($p < 0.01$, one-tailed), and smaller audit committees ($p < 0.05$, one-tailed) than the control firms. Both the MW firms and control firms show improvement in the independence of their audit committees, and by the first year following the MW detection, the MW firms and control firms no longer exhibit significant difference in the independence of their audit committees.

Panel A also shows that the MW firms are prompt in adding directors with accounting financial expertise to their audit committees. As such, by the year of the MW detection, the MW firms and control firms no longer differ in terms of the proportion of audit committee members with accounting financial expertise. An intriguing finding is that both the MW firms and control firms do not improve the proportion of audit committee members with nonaccounting financial expertise, despite the fact that the definition of financial expertise in the final version of SOX includes such financial expertise. Hence, it appears that both the MW firms and control firms value accounting financial expertise of their audit committee members more than nonaccounting financial expertise.

The panel also shows a remarkable difference in the speed in which the MW firms and control firms increase the size of their audit committees. While the control firms show little expansion in their audit committees, the MW firms increase the size of their

audit committees, such that by the year of the MW detection, the size of audit committees is no longer significantly different between the two groups of firms. A plausible interpretation for this finding is that the MW firms believe that a larger audit committee is more effective in resolving internal control issues and are promptly devoting more resources to the audit committee during the year of the MW detection. Nonetheless, the audit committee size of the MW firms becomes stable after that. Not surprisingly, the audit committees of the MW firms meet more frequently than their counterparts in the year of MW detection. The differences in the audit committee frequency between the two groups of firms persist until the second year following the MW detection ($p < 0.01$, one-tailed).

Turning to the full board characteristics, Panel B shows that the MW firms have less independent boards than the control firms in the year prior to the MW detection ($p < 0.01$, one-tailed). Although both the MW firms and control firms improve their board independence during the three-year period, the rate of improvement of board independence is faster for the MW firms. In the year following the MW detection, the board independence of the MW firms and control firms is no longer significantly different. The control firms expand their board size during the three-year period, but the board size of the MW firms is virtually unchanged during this period. Because a larger board size reduces effectiveness, this finding may suggest that board monitoring of the control firms actually deteriorate during this period.

The results on board meeting frequency are similar to those of audit committee meeting frequency. Starting from the year of the MW detection, the boards of the MW firms meet more frequently than the boards of the control firms, and this result persists until the second year following the MW detection. Last, the proportion of MW firms and control firms with a split CEO and Chairman positions increases during the three-year period. In the second year following the MW detection, there is a significantly higher proportion of MW firms with split CEO and Chairman positions than the control firms ($p < 0.05$, one-tailed). This result is consistent with the MW firms' attempts to strengthen their corporate governance structure by splitting the CEO and Chairman positions upon the revelation of deficiencies in their internal control systems.

Column 8 shows that overall, both the MW firms and control firms show significant improvements in their audit committee independence, audit committee accounting financial expertise, audit committee size, audit committee meeting frequency, board independence, board meeting frequency, and duality structure. Column 7 further shows that the improvements in these governance characteristics, with the exception of duality structure, are greater for the MW firms than for the control firms ($p < 0.05$, one-tailed).

Table 13: OLS regression results on the incidence of MW and improvement in overall governance structure

CHANGE $= a + b_1MWF + b_2STKPERF + b_3ZFC + b_4LGTA + b_5MARESTR + b_6RESTATE + b_7LITIGATION + b_8BLOCKOWN + b_9INSIDEOWN + b_{10}INSTOWN + \varepsilon$[a]

	Expected sign	Model 1		Model 2	
Variable[b]		**Coefficient Estimates**	**t-stats** [c]	**Coefficient Estimates**	**t-stats** [c]
Intercept	?	1.92	4.92***	2.66	4.57***
MWF	+	0.88	4.71***		
STKPERF	+	-0.046	-0.56	-0.0020	-0.02
ZFC	-	-0.074	-0.19	-0.19	-0.37
LGTA	+	0.10	2.15**	0.050	0.72
MARESTR	+	0.27	1.74**	0.12	0.49
RESTATE	+	-0.019	-0.10	-0.19	-0.70
LITIGATION	+	-0.054	-0.36	0.17	0.78
BLOCKOWN	+	0.013	2.68***	0.014	1.85*
INSIDEOWN	+	-0.00092	-0.15	-0.0020	-0.18
INSTOWN	+	0.044	0.14	0.42	0.81
SEVERE	+			0.18	0.60
PERVADE	+			0.042	0.81
PERSIST	+			0.31	1.10
R-squared		0.11		0.017	
n		368		184	

***, **, * Significant at 1 percent, 5 percent, and 10 percent levels respectively, based on one-tailed tests where signs are predicted, two-tailed tests otherwise.

[a] The regression model is for Model 1 and the regression result is based on both the MW firms and control firms. Model 2 replaces MWF with SEVERE, PERVADE, and PERSIST and the regression result is based on the MW firms.

[b] See APPENDIX B for definitions of independent variables. The dependent variable in Model 1 is CHANGE, which is a composite measure of the overall improvement in governance structure (effectiveness of the audit committee and the board) of a firm.

[c] The Breusch-Pagan test does not show the presence of heteroskedasticity. Hence, the usual t-statistics are presented.

Model 1 of Table 13 shows the results of the OLS model which regresses CHANGE, the overall improvement in governance structure, on MWF, financial variables, and other external monitoring mechanism variables. Consistent with expectations, MWF is positive and significant ($p < 0.01$, one-tailed), suggesting that the MW firms show greater overall improvement in their governance structures than the control firms. Among the financial variables, LGTA and MARESTR are both positive and significant ($p < 0.05$, one-tailed), consistent with larger firms and firms that undergo mergers, acquisitions, or restructuring showing greater overall improvement in their governance structures. Last, BLOCKOWN is positive and significant ($p < 0.01$, one-tailed), providing support that large blockholders may have intensified the pressures for firms to improve their governance structures.

In summary, the results in this section support Hypothesis 4 in that the MW firms show greater improvement in their audit committee independence, audit committee accounting financial expertise, audit committee size, and board independence than the control firms. Using a composite measure to capture the overall improvement in the governance structures, I also find that the MW firms show greater overall improvement in the effectiveness of their audit committees and their boards than the control firms. In the next section, I present the empirical results on whether the extent in which the MW firms improve their governance structures is contingent on the severity, pervasiveness, and persistence of the firm's MW.

Table 14: Descriptive statistics and univariate test results on the relation between the severity, pervasiveness, and persistence of MW and the improvement in governance structures

	Severity of MW (SEVERE)[a]			Pervasiveness of MW (PERVADE) [b]			Persistence of MW (PERSIST) [c]		
Variables [d]	**SEVERE=1 (n=77)**	**SEVERE=0 (n=107)**	**t-stats[e]**	**≥ Median (n=94)**	**< Median (n=90)**	**t-stats[e]**	**PERSIST=1 (n=51)**	**PERSIST=0 (n=133)**	**t-stats[e]**
ΔACINDP	0.21	0.16	0.77	0.17	0.19	-0.30	0.11	0.20	-1.22
ΔACCEXP	0.14	0.13	0.35	0.15	0.11	1.15	0.17	0.12	1.45*
ΔNONACCEXP	-0.018	0.018	-0.97	0.0065	-0.0001	0.19	-0.002	0.0047	-0.15
ΔACSIZE	0.22	0.21	0.12	0.19	0.23	-0.33**	0.21	0.21	0.04
ΔACMEET	5.88	3.88	2.31***	5.78	3.58	2.76**	7.27	3.73	3.26***
ΔBDINDP	0.13	0.087	2.24**	0.12	0.097	0.91	0.13	0.097	1.47*
ΔBDSIZE	-0.22	0.16	-1.43*	-0.26	0.28	-2.08	-0.33	0.13	-1.56*
ΔBDMEET	2.06	1.75	0.35	2.04	1.72	0.38	3.09	1.42	1.49*
ΔDUALITY	0.14	0.11	0.21	0.15	0.10	0.29	0.078	0.14	-0.50
CHANGE	4.19	3.79	1.88**	4.13	3.78	1.62**	4.29	3.82	1.95**

***, **, * Significant at 1 percent, 5 percent, and 10 percent levels respectively, based on one-tailed tests

[a] SEVERE is an indicator variable that is coded 1 if the firm has one or more severe MW, and 0 otherwise. Severe MW is defined in APPENDIX C.

[b] PERVADE is the total number of different categories of MW that a MW firm has. For the purpose of presenting the descriptive statistics, I classify the MW firms based on whether PERVADE is less than the median of all MW firms, or greater than or equal to the median of all MW firms.

[c] PERSIST is an indicator variable that is coded 1 if MW are not remediated within two years from the MW detection, and 0 otherwise.

[d] See APPENDIX B for definitions of variables. The prefix Δ indicates the change in the governance variables from the year before the MW detection to the second year following the MW detection.

[e] A two-sample t-test is used to test for significant differences in means between each sub-samples of firms.

5.6 The Relation between the Severity, Pervasiveness, and Persistence of MW, and the Improvement in Governance Structure (Hypotheses 4a)

Table 14 presents the descriptive statistics and univariate test results on the relation between the severity (SEVERE), pervasiveness (PERVADE), and persistence (PERSIST) of MW and the extent to which MW firms improve their governance structures. The table shows how the changes in each of the governance variables differ in sub-samples of the MW firms classified based on the severity, pervasiveness, and persistence of MW. The corporate governance changes are measured from the year before the MW detection to the second year following the MW detection. A positive change for each variable indicates an improvement in that governance characteristic, except for BDSIZE, in which case a negative change indicates an improvement. Just as before, CHANGE is the composite measure that captures the extent of improvement in all the nine audit committee and board characteristics, with higher scores indicating a greater extent of improvement in overall governance structures.

The results in Table 14 show that the audit committee meeting frequency and board independence for firms that have one or more severe MW increase more over the three-year period than those of firms that do not have severe MW ($p < 0.01$ and $p < 0.05$, respectively, one-tailed). Consistent with expectations, there is some evidence that the board size decreases more for firms that have one or more severe MW ($p < 0.10$, one-tailed). Contrary to expectations, firms with more pervasive MW show lower increases in audit committee size than for firms with less pervasive MW ($p < 0.05$, one-tailed). However, as predicted, firms with more pervasive MW show greater increases in audit

committee meeting frequency ($p < 0.05$, one-tailed). There is also some empirical support that firms with more persistent MW show greater increases in audit committee accounting financial expertise ($p < 0.10$, one-tailed), audit committee meeting frequency ($p < 0.01$, one-tailed), board independence ($p < 0.10$, one-tailed), board meeting frequency ($p < 0.10$, one-tailed), and greater decreases in board size ($p < 0.10$, one-tailed) than firms with less persistent MW. Last, the improvement in the overall governance structure, CHANGE, is significantly greater for firms with more severe, pervasive, and persistent MW ($p < 0.05$, one-tailed).

Model 2 of Table 13 shows the regression results that more rigorously test the relation between the overall improvement in governance structure (CHANGE) and the severity, pervasiveness, and persistence of MW. The variables SEVERE, PERVADE, and PERSIST are not statistically significant at conventional levels. Hence, although the univariate test results show that the overall improvement in governance structure is greater for firms with more severe, pervasive, and persistent MW, these results do not hold in the regression model which control for other variables.

Overall, there is little or no empirical evidence to support Hypothesis 4a that the extent of improvement in governance structure increases in the severity, pervasiveness, and persistence of MW. Nevertheless, the results in the previous section provide strong empirical support that MW firms show greater extent of improvement in their overall governance structures upon MW detection than the control firms. Such improvement in governance structures may be an attempt by the MW firms to restore investor confidence,

recover reputational capital, reduce legal liability, recover stock performance, etc. If investors indeed believe that the improvement in governance structures will lead to better monitoring by the audit committee and the board, they are likely to have greater confidence in the firm's financial reporting and react positively to such changes. The next section presents the empirical results to test the relation between the improvement in governance structures and the long-run buy-and-hold abnormal returns.

5.7 The Relation between Improvement in Governance Structures and Long-Run Buy-and-Hold Abnormal Returns (Hypothesis 5)

The results in the previous section show that the MW firms improve on some governance characteristics from the year before the MW detection to the second year following the MW detection, but not on others. Hence, I focus my analyses in this section on those characteristics that show improvement: (1) audit committee independence, (2) audit committee accounting financial expertise, (3) audit committee size, (4) board independence, and (5) duality structure. Although audit committee and board meeting frequency both increase for the MW firms, I do not conduct analyses on these variables because the interpretation of an increase in these variables is not straightforward. For instance, an increase in meeting frequency during this period may simply reflect the firms' efforts toward meeting SOX 404 compliance and may not necessarily reflect a greater diligence or effectiveness on the firms' audit committees and boards. It is even possible that a greater meeting frequency may reflect potential internal control problems, which may not be perceived positively by capital market participants.

Panel A of Table 15 provides the descriptive statistics and univariate test results on the relation between the improvement in governance structures and the two-year buy-and-hold abnormal returns. Four measures of buy-and-hold abnormal returns are presented and they are computed from the year before the MW detection to the year after the MW detection. BHAR_EW, BHAR_VW, BHAR_SP, and BHAR_CTRL represent buy-and-hold returns computed relative to the CRSP equal-weighted index, CRSP value-weighted index, CRSP S&P 500 index, and the control firms, respectively. The buy-and-hold abnormal returns are provided separately for the MW firms that experience a positive change in each governance characteristic, and for the MW firms that experience a zero or negative change in each characteristic.

Table 15: The relation between the improvement in governance structures and two-year buy-and-hold abnormal returns[a]

Panel A: Descriptive statistics and univariate test results

Variable[b]	Change from year t-1 to t+1 relative to the MW detection	BHAR_EW[c]	BHAR_VW[c]	BHAR_SP[c]	BHAR_CTRL[c]
ACINDP	Change > 0 (n=36)	-0.025	0.33	0.45	-0.8
	Change ≤ 0 (n=148)	-0.17	0.14	0.25	-0.78
	t-statistics[d]	*0.80*	*1.07*	*1.08*	*-0.07*
ACCEXP	Change > 0 (n=79)	-0.20	0.12	0.23	-0.90
	Change ≤ 0 (n=105)	-0.088	0.22	0.33	-0.70
	t-statistics[d]	*-0.84*	*-0.68*	*-0.67*	*-1.20*
ACSIZE	Change > 0 (n=54)	0.070	0.37	0.48	-0.72
	Change ≤ 0 (n=130)	-0.22	0.099	0.21	-0.81
	t-statistics[d]	*1.93***	*1.72***	*1.70***	*0.54*
BDINDP	Change > 0 (n=126)	-0.095	0.24	0.35	-0.81
	Change ≤ 0 (n=58)	-0.23	0.042	0.15	-0.73
	t-statistics[d]	*0.94*	*1.28**	*1.30**	*-0.42*
DUALITY	Change > 0 (n=23)	-0.15	0.12	0.23	-0.76
	Change ≤ 0 (n=161)	-0.13	0.19	0.29	-0.79
	t-statistics[d]	*-0.06*	*-0.32*	*-0.33*	*0.13*

***, **, * Significant at less than 1 percent, 5 percent, and 10 percent levels, respectively based on one-tailed tests.

[a] Each of the abnormal return is measured from the year before the MW detection to the year after the MW detection.

[b] See APPENDIX B for definitions of independent variables.

[c] BHAR_EW, BHAR_VW, BHAR_SP, and BHAR_CTRL represent buy-and-hold returns computed relative to the CRSP equal-weighted index, CRSP value-weighted index, CRSP S&P 500 index, and the control firms, respectively.

[d] A two-sample t-test is used to test for significant differences in means between the MW firms that experience a positive change in each governance characteristic and the MW firms that experience a zero or negative change in each governance characteristic.

Table 15 (continued)

Panel B: Descriptive statistics of the variables in the regression of BHAR and governance structures

Variable[a]	Mean	Std. Dev.	Median	First Quartile	Third Quartile
BHAR_EW	-0.14	0.95	-0.44	-0.81	0.36
BHAR_VW	0.18	0.98	-0.094	-0.53	0.61
BHAR_SP	0.29	0.98	0.033	-0.42	0.71
BHAR_CTRL	-0.78	1.11	-0.81	-1.38	-0.057
ΔACINDP	0.18	0.43	0.00	0.00	0.00
ΔACCEXP	0.098	0.19	0.00	0.00	0.25
ΔACSIZE	0.22	0.75	0.00	0.00	1.00
ΔBDINDP	0.094	0.17	0.067	0.00	0.17
ΔDUALITY	-0.0054	0.81	0.00	0.00	0.00
ΔROA	0.030	0.24	0.014	-0.030	0.077
BMV	-0.72	14.6	0.48	0.24	0.74
MVE	5.97	1.52	5.82	4.95	6.93

[a] See APPENDIX B for definitions of variables. The prefix Δ indicates the change in the governance variables from year t-1 to t+1.

Panel C: Pearson correlation coefficients among independent variables

Variable[a]	ΔACINDP	ΔACCEXP	ΔACSIZE	ΔBDINDP	ΔDUALITY	ΔROA	BMV	MVE
ΔACINDP	1.00	0.077	0.028	0.35***	-0.12*	-0.098	0.016	-0.11
ΔACCEXP		1.00	-0.091	0.12	0.039	0.028	-0.19***	-0.015
ΔACSIZE			1.00	-0.014	0.038	-0.0023	0.13*	0.042
ΔBDINDP				1.00	-0.010	-0.0053	0.038	-0.032
ΔDUALITY					1.00	0.13*	0.078	0.092
ΔROA						1.00	-0.010	-0.20***
BMV							1.00	0.24***
MVE								1.00

***, **, * Significant at less than 1 percent, 5 percent, and 10 percent levels, respectively based on two-sided tests.

[a] See APPENDIX B for definitions of independent variables. The prefix Δ indicates the change in the governance variables from year t-1 to t+1.

The panel indicates that the MW firms that improve on audit committee independence generally experience greater BHAR than firms that do not. However, the differences in the four measures of BHAR between the two groups are not statistically significant. The panel also shows that the MW firms that improve the accounting financial expertise of their audit committees experience lower BHAR than the MW firms that do not, although the differences between the two groups are not statistically significant. One possible reason for this counter-intuitive result is that the capital market participants may perceive the addition of accounting financial experts to the audit committees as an attempt by the firm to deal with potential or ongoing internal control problems. As a result, the market penalizes the firms rather than reward them for such improvement.

The panel further shows that the MW firms that increase audit committee size and board independence experience greater BHAR than the MW firms that do not, based on all measures of BHAR, except BHAR_CTRL in the case of board independence. The difference in BHAR between the MW firms that increase audit committee size and MW firms that do not is significant based on all measures of BHAR except BHAR_CTRL ($p < 0.05$, one-tailed). The difference in BHAR between the MW firms that increase board independence and the MW firms that do not is marginally significant using BHAR_VW and BHAR_SP ($p < 0.10$, one-tailed). Last, there is no evidence that the MW firms that split the CEO and Chairman positions experience greater BHAR than the MW firms that do not.

I more rigorously test the relation between the improvement in governance characteristics and BHAR using an OLS regression model. Panel B of Table 15 provides the descriptive statistics for the variables used in the regression. During the two-year period centered on the MW detection, the MW firms experience smaller BHR relative to the CRSP equal-weighted index and the control firms (BHAR_EW, BHAR_CTRL < 0). However, the MW firms experience greater BHR relative to the CRSP value-weighted index and CRSP S&P 500 index (BHAR_VW, BHAR_SP > 0). Eighteen percent of the MW firms change from a non-fully independent audit committee to one that is fully independent. On average, the MW firms add about one accounting financial expert to their audit committees and increase the size of their audit committees by 0.22. Board independence also increases by an average of about 0.10, and there is a net decrease in the number of firms that split the CEO and Chairman positions. On average, the MW firms experience a three percentage points increase in their ROA during the period. Last, the mean book-to-market value of the MW firms is -0.72 and the mean log of market value of the MW firms is 5.97.

Panel C of Table 15 shows the Pearson correlations among the independent variables in the regression. The correlation coefficients range from -0.20 (between ΔROA and MVE) to 0.35 (between ΔACINDP and ΔBDINDP). The VIFs of all the independent variables are under 2.5, suggesting that multicollinearity is not a concern.

Table 16: OLS regression results on the relation between the improvement in governance structures and two-year buy-and-hold abnormal returns[a]

$$BHAR = a + b_1 \Delta ACINDP + b_2 \Delta ACCEXP + b_3 \Delta ACSIZE + b_4 \Delta BDINDP + b_5 \Delta DUALITY + b_6 \Delta ROA + b_7 BMV + b_8 MVE + \varepsilon$$

	Expected sign	Model 1 (BHAR_EW) [a]		Model 2 (BHAR_VW) [a]		Model 3 (BHAR_SP) [a]		Model 4 (BHAR_CTRL) [a]	
Variable [b]		Coefficient Estimates	t-stats[c]	Coefficient Estimates	t-stats[c]	Coefficient Estimates	t-stats[c]	Coefficient Estimates	t-stats[c]
Intercept	?	0.54	1.81*	0.83	2.79***	0.94	3.14***	-0.85	-2.38
ΔACINDP	+	-0.072	-0.41	-0.035	-0.20	-0.034	-0.20	-0.091	-0.44
ΔACCEXP	+	-0.26	-0.69	-0.30	-0.80	-0.30	-0.80	-0.35	-0.78
ΔACSIZE	+	0.17	1.86**	0.14	1.57*	0.14	1.55*	0.040	0.37
ΔBDINDP	+	0.86	2.70***	0.97	2.31**	0.98	2.33***	0.50	0.99
ΔDUALITY	+	-0.032	-0.55	-0.030	-0.36	-0.030	-0.36	-0.12	-1.14
ΔROA	+	0.91	2.72***	1.04	3.55***	1.05	3.57***	1.41	4.00***
BMV	?	0.0093	2.81***	0.0096	1.97**	0.0096	1.97**	0.0037	0.62
MVE	?	-0.13	-2.94***	-0.13	-2.73***	-0.13	-2.72***	0.0030	0.05
R-squared		0.13		0.14		0.14		0.06	
n		184		184		184		184	

***, **, * Significant at 1 percent, 5 percent, and 10 percent levels respectively, based on one-tailed tests where signs are predicted, two-tailed tests otherwise.

[a]Each of the abnormal return is measured from the year before the MW detection to the year after the MW detection.

[b] See APPENDIX B for definitions of independent variables. The prefix Δ indicates the change in the governance variables from the year before the MW detection to year after the MW detection.

[c] The Breusch-Pagan test shows the presence of heteroskedasticity in Model 1. Hence, the t-statistics that are robust to heteroskedasticity are computed for Model 1. The usual t-statistics are presented for the other models.

Models 1, 2, 3, and 4 of Table 16 show the regression results using BHAR_EW, BHAR_VW, BHAR_SP, and BHAR_CTRL, respectively. The results based on the first three measures are similar but differ from those of BHAR_CTRL, in which none of the corporate governance change variables is significant. In the models using the first three measures, the results are consistent with that of the univariate tests. In all three models, ΔACSIZE is positive and significant ($p < 0.05$, one-tailed in Model 1, and $p < 0.10$, one-tailed in Models 2 and 3). In all three models, ΔBDINDP is also positive and significant ($p < 0.01$, one-tailed in Models 1 and 3, and $p < 0.05$, one-tailed in Model 2). These results provide empirical support that the market values the increases in audit committee size and board independence. The latter result is also consistent with Farber (2005) who finds a significant positive relation between the change in board independence and long-run buy-and-hold abnormal returns.

The other corporate governance change variables are not statistically significant at conventional levels in any of the models. Consistent with expectations, the change in return on assets is positive and significant ($p < 0.01$, one-tailed). Also, in all three models, the book-to-market value is positive and significant ($p< 0.01$, two-tailed in Model 1, and $p < 0.05$, two-tailed in Models 2 and 3) and the log of market value of equity is negative and significant ($p < 0.01$, two-tailed).

Table 17: OLS regression results on the effect of the severity, pervasiveness, and persistence of MW on BHAR_EW

$$BHAR = a + b_1 \Delta ACSIZE + b_2 \Delta BDINDP + b_3 SEVERE + b_4 PERVADE + b_5 PERSIST + b_6 \Delta ACSIZE \text{ X } SEVERE + b_7 \Delta ACSIZE \text{ X } PERVADE + b_8 \Delta ACSIZE \text{ X } PERSIST + b_9 \Delta BDINDP \text{ X } SEVERE + b_{10} \Delta BDINDP \text{ X } PERVADE + b_{11} \Delta BDINDP \text{ X } PERSIST + b_{12} \Delta ROA + b_{13} BMV + b_{14} MVE + \varepsilon$$

		Model 1		Model 2		Model 3	
Variable [a]	**Expected sign**	**Coefficient Estimates**	**t-stats** [b]	**Coefficient Estimates**	**t-stats** [b]	**Coefficient Estimates**	**t-stats** [b]
Intercept	?	0.78	2.60***	0.71	2.29**	0.72	2.31**
ΔACSIZE	+	0.054	0.34			0.052	0.33
ΔBDINDP	+			0.76	1.11	0.75	1.10
SEVERE	?	0.11	0.63	0.085	0.41	0.13	0.62
PERVADE	?	-0.048	-1.41	-0.038	-1.05	-0.051	-1.33
PERSIST	?	-0.095	-0.53	-0.16	-0.82	-0.18	-0.92
ΔACSIZE X SEVERE	+	-0.0092	-0.04			-0.048	-0.21
ΔACSIZE X PERVADE	+	0.0048	0.12			0.010	0.26
ΔACSIZE X PERSIST	-	0.30	1.19			0.24	0.98
ΔBDINDP X SEVERE	+			-0.37	-0.33	-0.40	-0.35
ΔBDINDP X PERVADE	+			-0.048	-0.24	-0.036	-0.18
ΔBDINDP X PERSIST	-			1.71	1.25	1.41	1.03
ΔROA	+	0.85	2.92***	0.98	3.24***	0.94	3.12***
BMV	?	0.0096	1.94*	0.010	2.14**	0.0093	1.86*
MVE	?	-0.12	-2.74***	-0.12	-2.69***	-0.12	-2.68***
R-squared		0.12		0.12		0.13	
n		184		184		184	

***, **, * Significant at 1 percent, 5 percent, and 10 percent levels respectively, based on one-tailed tests where signs are predicted, two-tailed tests otherwise.

[a] See APPENDIX B for definitions of independent variables. The prefix Δ indicates the change in the governance variables from the year before the MW detection to year after the MW detection.

[b] The Breusch-Pagan test does not show the presence of heteroskedasticity. Hence, the usual t-statistics are presented.

5.8 The Effect of the Severity, Pervasiveness, and Persistence of MW on the Relation between Improvement in Governance Structures and Long-Run Abnormal Returns (Hypotheses 5a)

The results in the previous section show that improvements in audit committee size and board independence are positively associated with two-year BHAR, which is consistent with the market valuing the firm's improvement in these governance characteristics. In this section, I delve further into whether this positive market reaction is increasing in the severity and pervasiveness of the MW and decreasing in the persistence of the MW disclosed.

Table 17 shows the regression results by further interacting SEVERE, PERVADE, and PERSIST with those governance variables in which the improvements are positively related to BHAR in the previous section, i.e. audit committee size and board independence. Models 1 and 2 show the regression results separately for audit committee size and board independence, and Model 3 shows the combined results of audit committee size and board independence in the same regression. Because the results are the same using the three measures of BHAR, I tabulate only the results using BHAR_EW. None of the interaction terms are significant in any of the three models and using any of the three measures. Hence, Hypothesis 5a is not supported and there is no empirical evidence that the positive relation between the improvement in audit committee size and board independence and long-run buy-and-hold abnormal returns is increasing in the severity, pervasiveness, and persistence of the MW detected.

CHAPTER 6

CONCLUSION

6.1 Summary of Study Findings

This study is motivated by the recent corporate scandals involving weak internal controls and the internal-controls reporting requirements of SOX. The study examines the causes and consequences of MW reported under SOX 302. The first objective is to shed light on the link between internal control quality and governance structures. I expect less effective audit committees and boards of directors to result in lower quality internal control monitoring, which leads to a greater incidence of MW. The results provide some empirical support for my expectations. Specifically, in the year prior to the MW detection, I find that firms with a lower proportion of audit committee members with accounting financial expertise, smaller audit committees, and lower proportions of board members who are independent, are more likely to be associated with the incidence of MW. There is also some evidence that firms with lower proportion of audit committee members with nonaccounting financial expertise are more likely to have MW.

The second objective of the study is to examine the reputational penalties faced by the top management, audit committee members, and outside directors on the board for firms that report MW. The empirical results are consistent with reputational penalties being imposed on these individuals for internal control failures. Specifically, I find some evidence that the top management in MW firms experience turnover at a rate greater than their counterparts in the control firms after controlling for other factors that may affect

the turnover of these individuals, such as poor financial performance. There is strong empirical support that the audit committee members and outside directors in the MW firms experience turnover at a rate greater than their counterparts in the control firms. I also find that the audit committee members and outside directors of the MW firms lose more outside directorships in other public companies than their counterparts in the control firms. This turnover of audit committee members and outside directors, and the loss in their outside directorships, further increase with the severity of the firm's MW.

The third objective of this study is to investigate the changes in governance structures of the MW firms from the year prior to the MW detection to the second year following the MW detection. Examining whether the governance structures of the MW firms improve is important, given that these firms are more susceptible to fraud and/or financial statement errors. Improvement in their governance structures can also be seen as tangible benefits accruing to stakeholders of weak firms that can potentially justify the high costs involved in the internal-controls reporting requirements of SOX. The empirical results show that the MW firms show improvements in their audit committee independence, audit committee accounting financial expertise, audit committee size, and board independence, and these improvements exceed those of the control firms. Using a composite measure to capture the overall improvement in governance structures, I also find that the MW firms show greater overall improvement in the effectiveness of their audit committees and their boards than the control firms. In the second year following the MW detection, the MW firms and control firms no longer exhibit differences in their

audit committee independence, audit committee accounting financial expertise, audit committee size, and board independence.

The last objective of this study is to provide evidence on whether the improvements in governance structures help restore investor confidence in the firm's financial reporting. If investors perceive that tangible benefits result from the improvements in governance structures, then they are likely to reward the firms through a higher market valuation. My results are consistent with this expectation. I find a positive relation between the improvements in the audit committee size and board independence of the MW firms and the firms' two-year buy-and-hold abnormal returns. This result provides empirical support that the market believes that the increases in audit committee size and the board independence improve the firm's financial reporting quality and reduce uncertainty in the firm's accounting numbers. The results are consistent with the internal-controls reporting requirements restoring investor confidence in financial reporting, which is fundamental in maintaining the stability of capital markets.

6.2 Contributions of this Study

This study makes several contributions. First, this study adds to the existing literature on the effectiveness of corporate governance mechanisms, such as the audit committee and board of directors. Most notably, this study uses data from the post-SOX period, which is a clear distinction from most studies examining the effectiveness of corporate governance mechanisms in the pre-SOX period. Because corporate governance mechanisms are likely to tighten subsequent to SOX, the post-SOX regime provides a

rich context to examine the effectiveness of corporate governance mechanisms and allow us to examine governance characteristics that may be further improved upon.

Second, this study complements Krishnan (2005) who examines the relation between audit committee characteristics and internal control quality using a sample of firms that changed auditors and reported internal control problems from 1994 to 2000. Her study finds that independent audit committees and audit committees with financial expertise are significantly less likely to be associated with the incidence of internal control problems. This study addresses some of the limitations in Krishnan (2005). For instance, this study uses a more representative sample of firms that reported internal control weaknesses subsequent to SOX, instead of a restricted sample of firms that disclosed internal control problems around auditor changes as in Krishnan (2005).[27] Further, because audit committee characteristics are correlated with board characteristics (Klein 2002a)[28] and the board also has fiduciary duties in monitoring internal controls, this study examines how *both* audit committee and board effectiveness is associated with the quality of internal controls. Nevertheless, this study and Krishnan (2005) enhance

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[27] Krishnan (2005) contends that this is one shortcoming that may affect the generalizability of the results of the study. Auditor-change companies tend to be smaller in size than the general population of companies and are traded on the smaller stock exchanges.

[28] The effectiveness of the audit committee may depend on board characteristics. For instance, Beasley and Salterio (2001) find that firms with strong board governance attributes are more likely to voluntarily form audit committees composed of members with relevant financial reporting and audit committee knowledge and experience. Klein (2002a) also finds that audit committee independence increases with board size and board independence. Last, the Blue Ribbon Committee on Improving the Effectiveness of Corporate Audit Committees (1999) states that "audit committee performance relies on the practices and attitudes of the entire board." Hence, failure to control for board characteristics can potentially introduce an endogeneity problem in the regression results.

our understanding on the important roles both the audit committee and the board play in ensuring effective internal controls both in the pre-SOX and post-SOX period.

Third, this study adds to the existing literature examining the reputational penalties faced by top management, audit committee members, and outside directors as a result of corporate failures. Prior research has examined the reputational penalties faced by top management and board directors due to poor financial performance and fraud. However, research has not examined whether these individuals face similar penalties for internal control failures. This study is the first to examine the reputational penalties resulting from internal control failures, a corporate failure that is perhaps more important than poor financial performance and often a precursor to fraud. Examining the reputational penalties effects due to ineffective internal controls will provide evidence on the effectiveness of labor market penalties as a mechanism for ensuring sound internal control systems, which are important in achieving high financial reporting quality.

Fourth, this study is one of the few studies that examines whether governance structures improve upon internal control failures. While many studies look at whether top management or board directors are replaced as a result of poor financial performance, only one study, Farber (2005) looks at whether governance structures improve upon the revelation of fraud. This study differs from Farber (2005) in that it looks at governance structure changes upon detection of internal control weaknesses, weaknesses that can result in less credible financial reporting. Because the internal-controls reporting requirements involve huge costs for firms, opponents have been skeptical of its benefits.

Hence, evidence that firms with weak internal controls improve their governance structures will provide evidence that the requirement produces results that benefit the capital market as a whole.

Last, this study examines whether the capital market perceives tangible benefits that result from the improvement in governance structures. Findings of a positive stock market reaction to these corporate governance improvements provide some support of a second order effect that the internal-controls reporting requirements restore investor confidence towards financial reporting. This result is fundamental to achieving a sound financial market, which has been shaken in recent years.

6.3 Limitations of this Study

The study is subject to limitations. First, the statistical power of the various tests performed may be low due to the small sample of 184 MW firms. While the small sample size strengthens the statistic power of variables found to be significant, it works against finding statistically significant results for others. Second, the final sample is obtained after the exclusion of many firms due to various reasons, e.g., non-accelerated filers, securities registration termination, delays in the filings of 10-Ks, weaknesses dated too far back, no proxy statements, etc. It is not clear how the exclusion of these firms may affect the results in this study. Third, 31 out of the 184 sample firms (16.8%) are matched based on the one-digit SIC code. Hence, the matching based on industry is not perfect. This limitation mainly results from using several criteria in the matching process (e.g. sales, exchange listing, industries, accelerated filer status), and that many firms

either went private or failed to file their 10-Ks under the new SOX requirements, which makes the pool of control firms more limited. Nevertheless, this limitation is mitigated by the fact that only 16.8% of the firms are matched based on one-digit SIC, and that 102 firms (55.4%) are matched based on four-digits. Further, if anything, the imperfect matching only adds more noise to the regression results, making it more difficult to reject the null hypotheses.

Fourth, this is a study of association, not causation. There is a possibility that unobserved factors that are correlated with both the dependent variables and independent variables of the various hypotheses drive the findings. For instance, there could be unobserved factors correlated with both internal control quality and the corporate governance characteristics (in the model used to test Hypothesis 1) that drive the results. This problem is mitigated by adding various control variables that are found to affect internal control quality in the extant literature (Ashbaugh et al. 2006a, Doyle et al. 2007a). Fifth, the proxies used to capture the effectiveness of the audit committee and the board may be crude. For instance, the number of meetings is used to capture the diligence of the audit committee and the board. However, the diligence is also dependent on the duration of each meeting and this information is not publicly available.

Sixth, although the findings show evidence of reputational penalties imposed on the top management, audit committee members, and outside directors in the MW firms, we do not know why turnover occurs. For instance, it is possible that these individuals leave the firms voluntarily in order to avoid being sued by shareholders for internal

control failures, rather than being ousted by the firm. Although it would be good to know the underlying reason for these individuals leaving the firms, such information is often not publicly disclosed, preventing a stronger test of reputational penalties.

Seventh, the results on the improvement in governance structure should be interpreted with caution. Although the MW firms improve more in their governance structures than the control firms (consistent with the detection of MW providing the impetus for these firms to improve their governance structures), it is possible that this result could be due to "ceiling effects," in which the control firms started out having strong governance structures and have less room for improvements. However, this problem is mitigated because the descriptive statistics in Table 3 show that there is still room for improvement in the governance structures of the control firms. Further, the control firms should also have adequate incentives to improve their governance structures in the wake of recent accounting scandals and the passage of SOX. One argument that strengthens the results in Hypothesis 4 is that if the MW firms started out as having weak governance structures, they should also have a greater tendency to remain weak in general and snub the improvement of governance structure. This self-selection in the choice of MW firms thus works against finding positive results for Hypothesis 4.

6.4 Directions for Future Study

There are many avenues for future study. First, this study focuses on MW disclosed under SOX 302. Future research can examine whether the same results hold for MW disclosed under SOX 404, especially on the impact of MW disclosed under SOX

404 on the governance structures. Because SOX 404 internal control assessments are more likely to be scrutinized by regulators and investors, the detection of MW under SOX 404 should provide even greater incentives for firms to improve their governance structures.

Second, this study focuses on accelerated filers. These firms are subject to early SOX 404 reporting and have greater pressures to improve their governance structures. Hence, the choice of these firms provides a stronger test of the various hypotheses in this study. Future research can examine whether non-accelerated filers, which are required to comply with SOX 404 at a later date, impose similar reputational penalties on those individuals charged with internal control monitoring, and face similar incentives to improve their governance structures as the accelerated filers.

Third, this study only examines the reputational penalties imposed on top management, audit committee members, and outside directors for internal control failures. Future research can examine whether other individuals, who also have responsibility in internal controls, face similar reputational penalties. An example would be to examine whether Chief Financial Officers or Chief Accounting Officers experience such turnover when MW are detected. Further, future research can examine whether top management loses key positions in other companies or is relegated to lower positions in other companies as a form of reputational penalties.

Last, this study only examines one impact of the improvement in governance structures, that is, the long-run abnormal returns. Future research can examine the capital market impact of improvement in governance structures in other areas, such as the cost of equity or the cost of debt. A reduction in the cost of equity or cost of debt following the improvement in governance structures would also be consistent with investor confidence in the firm's financial reporting being restored. Alternatively, researchers may also be interested to find out whether the improvement in governance structures brings about an improvement in the earnings quality of the firm.

APPENDIX A

SUMMARY OF HYPOTHESES

Hypothesis 1: Firms with weaker corporate governance structures, i.e. less effective audit committees and boards of directors, are more likely to have MW.

Hypothesis 2a: Firms with MW experience greater turnover of audit committee members and outside directors following the MW detection, compared to firms without internal control weaknesses.

Hypothesis 2b: Audit committee members and outside directors in firms with MW lose more outside directorships in other public companies following the MW detection, compared to their counterparts in firms without internal control weaknesses.

Hypothesis 2c: Firms with MW experience greater turnover of top managers, i.e. CEO, Chairman, or President, compared to firms without internal control weaknesses.

Hypothesis 3a: Firms with more severe, pervasive, and persistent MW experience greater turnover of top managers, audit committee members and outside directors following the MW detection.

Hypothesis 3b: Audit committee members and outside directors of firms with more severe, pervasive, and persistent MW lose more directorships in other firms following the MW detection.

Hypothesis 4: Corporate governance structures, i.e., effectiveness of the audit committees and boards of directors, of the MW firms improve upon the MW detection, when compared to the control firms.

Hypothesis 4a: For firms with MW, improvement in corporate governance structures, i.e., effectiveness of the audit committees and boards of directors, is increasing in the severity, pervasiveness, and persistence of the MW.

Hypothesis 5: For firms with MW, improvement in corporate governance structures, i.e., effectiveness of the audit committees and boards of directors, results in a positive long-run buy-and-hold abnormal returns.

Hypothesis 5a: For firms with MW, the positive effect of improvement in corporate governance structures, i.e., effectiveness of the audit committees and boards of directors, on long-run buy-and-hold abnormal returns is (1) greater when the MW are more severe and pervasive, and (2) smaller when the MW are more persistent.

APPENDIX B

VARIABLE DEFINITION

Variables	Expected Sign	Definition
Variables in the model examining the incidence of MW (Hypothesis 1)		
MWF	N.A.	An indicator variable that is coded 1 for firms with MW, and 0 for control firms.
Corporate governance variables		
ACINDP	-	An indicator variable that equals 1 if the audit committee consists of fully independent members, and 0 otherwise.
ACCEXP	-	The proportion of audit committee members with accounting financial expertise, i.e., experience as a public accountant, auditor, principal or chief financial officer, controller, or chief accounting officer.
NONACCEXP	-	The proportion of audit committee members with nonaccounting financial expertise, i.e., experience as a CEO, president, general partner, or managing director of a for-profit corporation.
ACSIZE	-	The number of audit committee members.
ACMEET	-	The number of times the audit committee meets per year.
BDINDP	-	The proportion of the board members who are independent.
BDSIZE	+	The number of total board members.
BDMEET	-	The number of times the board meets per year.
DUALITY	-	An indicator variable that equals 1 if the CEO and Chairman of the board positions are held by different individuals, and 0 otherwise.
BLOCKOWN	-	The percentage of stock held by blockholders in the firm.
INSIDEOWN	-	The total percentage of stock held by management and directors.
INSTOWN	-	The total percentage of stock held by all institutional owners of the firm.
Financial variables		
LGTA	-	The log of the total assets of the firm (data item #6 of Compustat).
ZFC	+	The financial distress measure, calculated from the probit coefficients of Zmijewski (1984). Greater values of ZFC indicate higher levels of distress present in the firm.

Variables	Expected Sign	Definition
SEGMENTS	+	The number of operating segments of the firm as reported by Compustat segment file.
FOREIGN	+	An indicator variable that equals 1 if the firm reports a non-zero foreign currency translation (Compustat item #150), and 0 otherwise.
MARESTR	+	An indicator variable that is coded 1 if restructuring charges (data item #376) are reported in Compustat, or the AFTNT1 file in Compustat indicates the presence of a merger and acquisition, and 0 otherwise.
GROWTH	+	The sales growth defined as current year's sales (data item #12) less prior year sales, scaled by prior year sales.
LITIGATION	-	An indicator variable that is coded 1 if the firm operates in industries with SIC codes of 2833-2836 (biotechnology), 3570-3577 and 7370-7374 (computers), 3600-3674 (electronics), and 5200-6961 (retailing), and 0 otherwise.
Additional variables for Hypotheses 2a and 2c		
MGTTURNOVER	N.A.	An indicator variable that is coded 1 if any individual holding the title of CEO, Chairman, and/or President in the year before the MW detection, leaves the firm within two years of the MW detection, and 0 otherwise.
ACTURNOVER	N.A.	The proportion of audit committee members in the year before the MW detection who leave the firm within two years of the MW detection, and 0 otherwise.
ACTURNOVER1	N.A.	An indicator variable that is coded 1 if at least one audit committee member in the year before the MW detection leaves the firm within two years of the MW detection, and 0 otherwise.
ACTURNOVER2	N.A.	An indicator variable that is coded 1 if at least half of the audit committee members in the year before the MW detection leave the firm within two years of the MW detection, and 0 otherwise.
ACTURNOVER3	N.A.	An indicator variable that is coded 1 if more than half of the audit committee members in the year before the MW detection leave the firm within two years of the MW detection, and 0 otherwise.
BDTURNOVER	N.A.	The proportion of outside directors in the year before the MW detection who leave the firm within two years of the MW detection, and 0 otherwise.

Variables	Expected Sign	Definition
BDTURNOVER1	N.A.	An indicator variable that is coded 1 if at least one outside director in the year before the MW detection leaves the firm within two years of the MW detection, and 0 otherwise.
BDTURNOVER2	N.A.	An indicator variable that is coded 1 if at least half of the outside directors in the year before the MW detection leave the firm within two years of the MW detection, and 0 otherwise.
BDTURNOVER3	N.A.	An indicator variable that is coded 1 if more than half of the outside directors in the year before the MW detection leave the firm within two years of the MW detection, and 0 otherwise.
STKPERF	-	The raw buy-and-hold returns over the month -12 to +12 relative to the MW detection.
RESTATE	+	An indicator variable that is coded 1 if a firm announces one or more earnings restatements from the year before the MW detection to the second year after the MW detection.
MGTAGE	+	The mean age of the individuals holding the positions of CEO, Chairman, and President.
MGTTENURE	-	The mean tenure of the individuals holding the positions of CEO, Chairman, and President.
ACAGE	+	The mean age of the audit committee members.
ACTENURE	-	The mean tenure of the audit committee members.
BDAGE	+	The mean age of the outside directors.
BDTENURE	-	The mean tenure of the outside directors.
Additional variables for Hypothesis 2b		
ACSEATLOSS	N.A.	The mean number of outside directorships in other public companies lost by the audit committee members from the year before the MW detection to the second year following the MW detection.
BDSEATLOSS	N.A.	The mean number of outside directorships in other public companies lost by the outside directors from the year before the MW detection to the second year following the MW detection.
ACSEATBEF	+	The mean number of outside directorships in other public companies held by the audit committee members in the year before the MW detection.
BDSEATBEF	+	The mean number of outside directorships in other public companies held by the outside directors in the year before the MW detection.

Variables	Expected Sign	Definition
ACSEATAFT	N.A.	The mean number of outside directorships in other public companies held by the audit committee members in the second year following the MW detection.
BDSEATAFT	N.A.	The mean number of outside directorships in other public companies held by the outside directors in the second year following the MW detection.
Additional variables for Hypotheses 3a and 3b		
SEVERE	+	An indicator variable that is coded 1 if the firm has one or more severe MW, and 0 otherwise. Severe MW is defined in APPENDIX C.
PERVADE	+	The total number of different categories of MW that a MW firm has. The different categories of MW are detailed in APPENDIX C.
PERSIST	+	An indicator variable that is coded 1 if MW are not remediated within two years of the MW detection, and 0 otherwise.
Additional variables for Hypotheses 4 and 4a		
CHANGE	N.A.	A composite measure of the overall improvement in audit committee and board characteristics. A firm is assigned a score of 1 for each positive change in governance characteristic from the year before the MW detection to the second year following the MW detection, except for board size, in which a score of 1 is assigned for a negative change. The individual scores are then summed up to obtain the composite score of improvement in governance structure, CHANGE. Higher values indicate a greater overall improvement in governance structure.
Additional variables for Hypotheses 5 and 5a		
BHR	N.A.	The two-year buy-and-hold return measured from months -12 to +12 relative to the MW detection. Measured the same way as STKPERF.
BHAR	N.A.	The two-year buy-and-hold abnormal return measured from months -12 to +12 relative to the MW detection.
BHAR_EW	N.A.	The BHR of the MW firms less the BHR of the CRSP equal-weighted index over the same period.
BHAR_VW	N.A.	The BHR of the MW firms less the BHR of the CRSP value-weighted index over the same period.
BHAR_SP	N.A.	The BHR of the MW firms less the BHR of the CRSP S&P 500 index over the same period.

Variables	**Expected Sign**	**Definition**
BHAR_CTRL	N.A.	The BHR of the MW firms less the BHR of the control firms over the same period.
CGVAR	+/-	The vector of governance variables that exhibit improvement from the year before the MW detection to the year after the MW detection.
ΔROA	+	The change in return on assets from the year before the MW detection to the year after the MW detection.
BMV	?	The book value per share divided by the market value per share of the MW firm in the year before the MW detection.
MVE	?	The log of the market value of equity of the MW firm in the year before the MW detection.

APPENDIX C

CATEGORIES OF MATERIAL WEAKNESSES

Severe MW

Ethical or compliance issues with personnel

Board, audit committee, corporate governance issues

Insufficient or non-existent internal audit function

Management/board/audit Committee investigation, internal investigation evident/noted

Ineffective regulatory compliance issues

Senior management competency, tone, reliability issues, and/or self-dealing issues

SEC or other regulatory investigations and/or inquiries

Insufficient management review, inadequate control procedures

Non-Severe MW

Failure in the application of accounting rules

Accounting documentation, policy and/or procedures

Accounting personnel resources, competency/training

Inadequate disclosure controls (timely, accuracy, completeness)

Information technology, software, security & access issue

Period-end closing & non-routine adjustment issues

Segregations of duties/ design of controls

Untimely or inadequate account reconciliations

Acquisition - integration and/or challenges noted

Audit opinion/consent/registration issues

Company size, financial constraints, other limiting issue

Event (8Ks, Form 4s etc.) disclosure issues

Financial closing process/ policy/information accumulation & timeliness issues

Financial records controlled in part or wholly by third party

Non-standard or non-financial closing processing issues

Proforma information disclosures inadequate

Unspecified disclosure control deficiencies

Note: I did not include the following categories in determining the different types of categories of MW because these categories do not actually describe the nature of the MW: remediation of material weakness identified, restatement of previous 404 disclosures, (disclaimer of opinion) or other limitations, revision made later to these 302/404 disclosures, Section 404 adverse report (recent past/pending) filed, and restatement (recent past or pending) evident.

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